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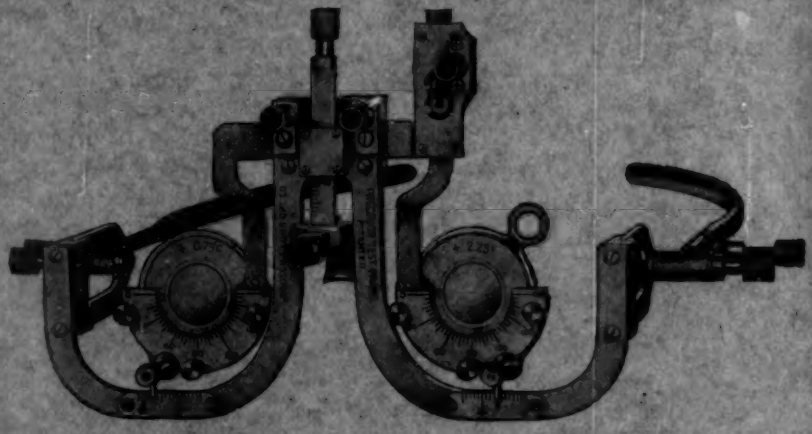

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DISCIFORM KERATITIS. (BANE'S CASE)

AMERICAN JOURNAL OF OPHTHALMOLOGY

Vol. 4 NOVEMBER, 1921 No. 11

DISCIFORM KERATITIS

WILLIAM C. BANE, M. D., AND WILLIAM M. BANE, M. D.

DENVER, COLORADO

This is the report of a case followed thru its course to recovery from inflammation and partial restoration of vision. The possible etiology is discussed.

In reporting the following case of disciform keratitis, we are making no attempt to give a review of the literature upon this disease, but will merely emphasize the most common and predominant signs and symptoms, and mention briefly some of those occurring less frequently. For comprehensive reviews of the literature, one may refer to an article by Weeks, in The Transactions of the Section on Ophthalmology of the A. M. A. for 1918, the article by Fleck in the A. J. O. for August 1921, and that of Junius in Graefe's Arch. f. Ophthalmologie v. 105 p. 177.

Miss. M. B., age 27 years, was referred to us on November 9th, 1920, giving the following brief history. For three weeks before coming she had noticed that the left eye was somewhat inflamed, and for the first two weeks it gave her very little discomfort and no perceptible change in vision. However, during the last week, the redness increased, the vision became hazy, and for five days and nights she suffered more or less pain in the eye and the left frontal region. She could throw no light upon the possible cause of the trouble, having had no injury or foreign body in the eye, no constitutional disease, nor smallpox.

First examination revealed a moderate circumcorneal congestion, a slight discoloration of the iris, with the pupil normal as to size and reactions. There was a haze in the substance of the cornea, about 4 mm. in diameter, its center being 1 mm. below and to the temporal side of the corneal center. The corneal epithelium showed no abrasion, and at this time there were no bloodvessels approaching the opacity. Vision: Right 5/4, Left 5/20. The pupil dilated readily with atropin, but the tension rose to 40 mm. mercury, and the use of it was not continued. The pain became gradually less severe after one or two days.

On November 24th, a blood Wassermann was negative with three antigens, but mercury suppositories of 7½ grains each were prescribed for three weeks. No benefit was observed. The opacity seemed more dense and extending downward, and the vision was reduced to 5/60. There was no pain nor congestion.

On December 20th, after three days of pain, she appeared with the eye red and tender to palpation. For the first time, about two months after the onset of her trouble, we noticed three smaller spots of greater density in the corneal disc, one in the center and in the deeper layers, the second more superficial and near the temporal margin of the original opacity, and the third a small grayish spot about ½ mm. in diameter near the temporal sclero-corneal margin. Also, for the first time, we observed three small bloodvessels extending from the scleral margin to the disc opacity. Began subconjunctival injections of 2% cinnamat of sodium, 15 m. at a dose.

January 15th. The subconjunctival injections have been repeated at intervals of four to seven days followed by severe pain lasting for an hour or so, but the eye has remained comfortable between visits. As a result of these injections, or merely as a coincidence, the

disc opacity has become much smaller in diameter, of less density, and the whiter spots in the substance of the cornea have disappeared. Eye not congested, nor tender.

On February 17th, the last date on which any notes of the case were recorded, the vision had returned to 5/20, and the opacity was thinner, but was pierced thruout by the bloodvessels. Apparently the process had come to a standstill. The illustration on Plate X, shows the appearance at this time, but the leash of vessels is not clearly shown.

Our patient's history of onset without definite etiology, together with the signs and symptoms, the protracted course, and the final outcome, unquestionably place her case among that class of cases described by Fuchs as disciform keratitis. It would seem, as pointed out by Weeks and others, that true disciform keratitis differs in several particulars from that type of keratitis which accompanies or results from smallpox or vaccine virus.

As to the etiology; having ruled out, as far as possible, injury, syphilis, smallpox and vaccine virus, we have yet to consider infection from without, the neuropathic origin as claimed by Verhoeff, and tuberculosis. Which of these was the etiologic factor in this case we cannot decide, but certainly the treatment under which the greatest improvement was obtained was subconjunctival injections of cinnamat of sodium. This is one of the drugs recommended in the treatment of various tuberculous lesions. Tuberculin was not used.

It seems well to emphasize two features of the disease noticeable in our case. First, it took about two months after the onset of the disease, before the deeper white spots in the already existing opacity made their appearance. Also that it was not until this time that the leash of vessels from the sclerocorneal margin to the disc were first noticed. The other thing worth emphasizing is the frequent tendency toward glaucoma, which these cases present. This fact also is mentioned by Weeks, and at the present time one of our colleagues has under his care a case of disciform keratitis, which developed an alarmingly high tension after the instillation of homatropin.

Summing up the information at hand concerning this disease at the present time, one can only conclude that the various forms of deep seated keratitis resembling true disciform keratitis, arise from a variety of causes, and that until further study and investigation have been made and more definite knowledge obtained, it will be impossible to make a positive differentiation between them.

LATE TRAUMATIC DETACHMENT OF RETINA. ITS PROPHYLAXIS AND IMPORTANCE FROM A DISABILITY COMPENSATION STANDPOINT

HAROLD GIFFORD, M. D., F. A. C. S.

OMAHA, NEBRASKA

The writer finds that practically all cases of monocular retinal detachment occurring in eyes not predisposed to such detachment, give a history of previous severe injury of the eye which may have occurred years before. Liability to such late detachments justifies treatment at the time of injury directed to its prevention. It also may become a very important consideration in the settlements for damages produced by the injury. Read before the Sioux Valley Eye and Ear Academy, July, 1921.

That a traumatic detachment of the retina may become apparent some time after the occurrence of the original injury, is probably fairly well known; nevertheless, an examination of a half dozen of the most popular ophthalmic textbooks has failed to record any appreciation, on the part of the authors, of the significance of the fact.

My own interest in the subject was first aroused by the following case: Feb. 22, 1902; L. C., aged 11; while manipulating a boy's "sling-shot," was struck in the right eye by the handle of the implement, which slipped out of his hand while the rubber was on the stretch. I saw him within half an hour and found the eye somewhat congested with a little blood in the anterior chamber and the vitreous too dark to permit a clear view of the fundus. In the course of the next two weeks, the blood cleared up, the congestion disappeared entirely, and as nothing wrong was discovered in the interior of the eye except slight vitreous opacities and a small lens opacity near the posterior pole, he was dismissed with vision 20/30+. The sight became practically as good as that of the other eye and remained so for nearly four years.

At the end of that time, he was again brought to me on account of a disturbance of vision of the right eye, which he had noticed for several days. I found a moderate sized detachment chiefly in the lower outer quadrant but reaching to the center; Vision, = 20/200. In spite of rest, bandaging and sweats, the detachment increased; and the only result of a good sized puncture of the sclera with cauterization of the wound edges, was a decrease in the vision from the increase of vitreous opacities which took place during the reaction following the puncture. The sight eventually decreased to fingers at 8 ft.; where it has remained for fifteen years. The left eye has always been normal with vision 20/15, after correction of a slight myopic astigmatism.

In succeeding years, the writer has paid especial attention to the history in his detachment cases, and he can recall no case, in a patient under 50, with the other eye normal, in which he has not obtained a history of a severe shock from a blow or fall on the head or eye, (in one case from a jet of water from a fire hose) preceding the appearance of the detachment by a period of from a day or so to (in one case) ten years.

The case, last referred to, was that of a man 26 years, who came to me, Nov. 10, 1919, with a detachment of the lower 2/3 of the left retina, and V. =4/200. The right eye had V=20/15 without a correction and was normal except for very slight vitreous opacities. Eleven years previously, he had received a hard blow on one eye with a piece of rubber hose, and had to keep it bandaged for two weeks. After that the sight seemed to be as good as ever and he noticed nothing wrong, till August 1918, when the sight of the left eye began to blur and gradually reached the condition seen in 1919. Altho the patient had no recollection

as to which eye had been hit; it seems not unreasonable to include this as a case of late traumatic detachment.

Deeply penetrating wounds doubtless cause late detachment in some cases, not from the contusion, but from the formation of vitreous bands. A remarkable case of this kind was reported by von Hippel (abst. in Arch. of Ophthal. July 1916, 319), in which a detachment developed 16 years after a shot wound which healed leaving a thin cord running thru the vitreous.

The recognition of the fact that detachment is liable to occur from one to several years after any severe blow on the head or eye, in spite of an apparently complete recovery from the immediate effects of the injury, is of importance in the management of such accident cases on at least two counts: prophylaxis and advice to the patient concerning settlements for damages or disability compensation. With regard to prophylactic treatment; assuming, as I think we may, that most of these late detachments occur because of slight retinal injuries, which from one cause or another have not been discovered, or not thought worth treating, at the time of the accident, it follows that after every noteworthy contusion of the eye, the entire fundus should be examined with the most scrupulous exactness and unless the oculist is certain that no lesion of the retina exists, or if the media are too hazy to permit such an examination, the case should be treated, not only for the evident lesions, but for the purpose of preventing a possible late detachment. Anyone who has not made a practice, in such cases, of dilating the pupil and very carefully examining the whole retina, will be surprised to find how often, after comparatively slight blows, lesions in the shape of small hemorrhages or areas of opaque and raised retina will be found. These are frequently in the extreme periphery where they may be easily overlooked. It is, naturally, impossible to say how many of these injuries would lead to late detachment or to what degree any early treatment will guard against the latter. Nevertheless, it cannot be denied that such prophylactic measures may turn the scale in favor of future immunity. Therefore, in addition to the ordinary measures, the writer keeps all such patients in bed or sitting at ease, with *both* eyes bandaged lightly for at least a week after the accident; this being combined, for the same length of time, with salicylat or pilocarpin sweats. The selection of an occlusion period one week in length is, of course, purely arbitary; less might suffice or more might be better; but the week seems a fair compromise betwen unreasonable strictness and recklessness. If the injury be a severe one, so that at the end of a week the media are still so hazy as to prevent a careful examination of the interior, two or three weeks of occlusion would undoubtedly be better. In enunciating this principle in the prophylactic treatment of late detachment, the writer is under no illusion as to the size of the following which it will attract; the vast majority of eye contusions will be treated, as heretofore, without reference to potential late detachments. He would, however, ask each of his readers, who realizes that such a result is by no means very uncommon, whether if he or his child were the subject of such an injury, he would not desire the cheap insurance theoretically afforded by a week's double occlusion bandage.

In the matter of prognosis and subsequent cure, the conclusion is obvious. Every patient with this sort of injury should be warned that he has a vulnerable optic which may eventually become blind; so that, for a couple of years at least, the avoidance of occupations or games involving much chance of bumps or jolts would be only a reasonable precaution.

The prognosis becomes of special importance if the patient carries accident or disability insurance; or if the injury has been caused by some financially responsible party. Here, it is the imperative duty of the physician to advise the patient not to settle for damages or compensation, except on a contingent basis, with a full recognition,

in writing, of the possibility of future loss of sight from the late detachment, or other remote results of the accident. The fact that the physician may be employed by the damager involves, of course, no waiver of this duty.

To emphasize the importance of this consideration, I report the following case: A. G., aged 44; injured by a dynamite explosion which destroyed the left eye and produced cataract in the right eye. The cataract was operated on and the man, on recovering nearly normal sight, settled in full for the sum of $600.00. Three years later he developed detachment of the retina, and when he consulted me, he had been totally blind for one year.

CONCLUSIONS: A large proportion of the detachments of early life, in unpredisposed eyes, are of the late traumatic class.

As a matter of prophylaxis against such detachments, a period of as complete rest as possible (including binocular bandage) is desirable in the treatment of serious contusions of the eye.

The possible occurrence of late detachment should always be provided for in settlements for damages, or disability compensation in cases of serious contusions of the eye. This applies with equal force to cases of deep perforating wounds with or without intraocular foreign bodies, or to accidents where the head or whole body has received severe shock.

TENOTOMY AND LOOPING FOR THE SURGICAL CORRECTION OF STRABISMUS

FREDERICK OSCAR SCHWARTZ, M.D.

ST. LOUIS, MO.

The advancement operation here described is practiced with tenotomy of the opposing muscle. It seeks to secure a firm anchorage and to prevent the failure of the sutures to hold by passing them thru the tendon which has been split and drawn aside in two loops, and thru two gold plates, which acts as a clamp.

In presenting this surgical procedure for the correction of strabismus, full cognizance is taken of the many excellent methods previously devised, their relative merits and the benefits of the final results. With these facts in mind, I can offer the following only with the addition of an apology, for I know that surgeons in general are bored to a greater or lesser degree by the inflictions of others.

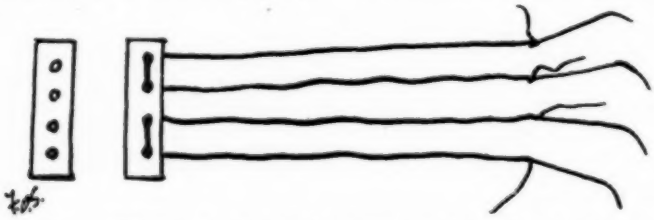

Fig. 1.—Gold plate thru which two double armed sutures are threaded and second plate over which they are tied on completion of the operation.

The primary object of correcting a strabismus, surgically, I feel is purely cosmetic. The restoration of vision along with binocular function, such as fusion and the perception of perspective, is secondary and develops gradually after the eye has been brought back into position and made to work.

During the past few years, in both my private work and the eye service at the Washington University Medical School, I have corrected a considerable number of cases of both internal and external squint with surgical measures. The results have been generally very good, altho some cases possessing deviations of 50° to 60° required two operations and even then were unsuccessful. However, this was the exception rather than the rule.

The chief deficiency of most technics lies in the fact that the sutures holding the tenotomized muscle pull thru its tissue or cause sloughing at the point of anchorage. A muscle that has slipped becomes attached again further back either to the globe or the conjunctiva and consequently exerts no pull, being completely relaxed, as has been demonstrated in cases where two operations had been done. Again, if the sutures should hold, there may be stretching of the various tissues.

Another point is that the amount of advancement, resection, or other manipulation to be done, cannot be accurately determined before operation, with a few exceptions, which again in turn have other disadvantages. Usually, the muscle pulling in the direction of the strabismus is tenotomized. It is the constant pull of the opposing muscle upon weakened parts of the exterior of the globe which is responsible for the many failures properly to correct a strabismus. This operation eliminates the foregoing faults.

The factors involved, then, are the establishment of a firm anchorage of the manipulated parts into tissues that are sufficiently firm to withstand stretching, and a consideration of the degree of rotation necessary to bring the eye back into as nearly a normal position as possible. It is obvious that the best permanent results in any operation for strabismus are obtained in

eyes where the vision develops as a natural consequence of resumed function or is helped by correct lenses, which combined forces help the eye to fix in a proper position, that is to say, with the macula.

Frequently I am asked "How do you determine the amount of muscle to take up?'" I have had to answer that usually I did not know exactly but that a maximum degree of advancement was desirable, an overcorrection sometimes being advantageous. In the following, I am able to determine with some degree of accuracy the proper amount of tendon to take up.

The problem is to straighten the crossed eye. The principle employed is to decrease the amount of pull of the muscle which is pulling the eye away from the central line of fixation, and then to increase the action of the opposing muscle. In this operation a tenotomy is done on the muscle having the greatest amount of pull and then a looping of the opposing one.

It has been the author's experience that it is well to do a complete tenotomy of the muscle with the excess of pull, for even then immediately following this step, there will be a turning of the eye toward the mid-line of about one-half its original deviation. This is especially true in cases showing a high degree of strabismus.

A point of importance is to measure accurately the degree of squint in each case by one of the approved methods and also to have a good photograph taken of the patient, a full front view, showing the precise nature of the defect.

The necessary equipment for this operation consists of a speculum, tenotomy shears, sharp pointed scissors two tenotomy hooks, dissecting forceps, needle holder, a small, sharp knife (a discarded Graefe is excellent), two double armed sutures with two small gold plates described below, and one single suture with which to close the tenotomy wound.

The two double armed sutures, about twelve inches long, are threaded through a plate seven mm. by two mm. rolled out of 14 karat gold wire, in which four holes one mm. in diameter and three-fourths mm. apart are drilled. The edges of these holes are smoothly polished so that the suture will not be cut by the rough edge of the circle.

Two of these plates are required in the technic, the first thru which the sutures are threaded in a manner described in the following paragraph, and the second over which the same sutures are tied upon the completion of the operation. One of the sutures (Fig. 1) is threaded thru the first

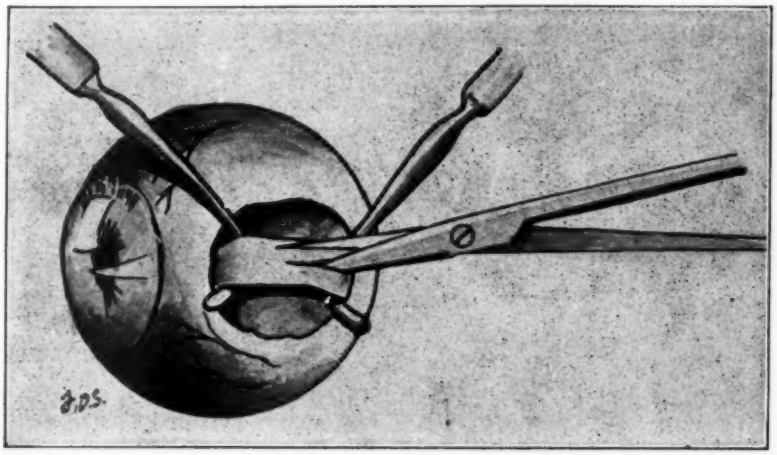

Fig. 2.—Showing muscle held up and away from globe by tenotomy hooks, while being split.

two holes of the plate with a loop on one side and the needles and remaining silk protruding on the other. The second suture is put thru the remaining two holes in a similar manner.

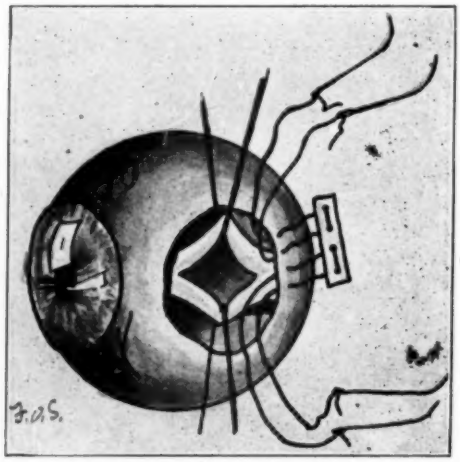

Fig. 3.—Split muscle separated by tension sutures, and the four sutures carrying the gold plate passed thru the conjunctiva.

Under cocain and adrenalin anesthesia a point is selected over the insertion of the muscle on the side of the globe toward which the eye turns, and an incision made thru the conjunctiva parallel with the equator. Tenon's capsule is then picked up and incised and the sclera exposed. A tenotomy hook is inserted with its rounded end pressed against the side of the eyeball and introduced underneath the muscle. This muscle is then brought up thru the incision, cut off close to its attachment, and permitted to slide back. The edges of Tenon's capsule are grasped and included in the suture which is now introduced thru the conjunctiva to close the wound.

Next, on the opposite side of the globe an incision is made thru the conjunctiva and Tenon's capsule at a point over the insertion of the opposing rectus, at right angles to its direction, sufficiently large to expose it for a number of millimeters of its length.

The rectus is brought up by means of a tenotomy hook in the usual way, and after it is exposed, another hook is introduced beneath it so that it may be freed from underlying and adjacent tissues for about ten millimeters of its length, by a gentle pulling on either hook in opposite directions.

The muscle is now held away from the globe by the hooks and its under surface gently roughened with a scalpel. This is done so that the finally approximated surfaces of muscle will adhere. It should be thoroly done and is an important step in the technic.

With the tenotomy hooks still holding the muscle away from the globe, it is split down its middle in the direction of its fibers with a small knife or scissors (Fig. 2), for a distance corresponding approximately to an amount slightly in excess of deviation of the strabismus in millimeters as determined by previous measurement. Care must be taken not to tenotomize or sever the muscle.

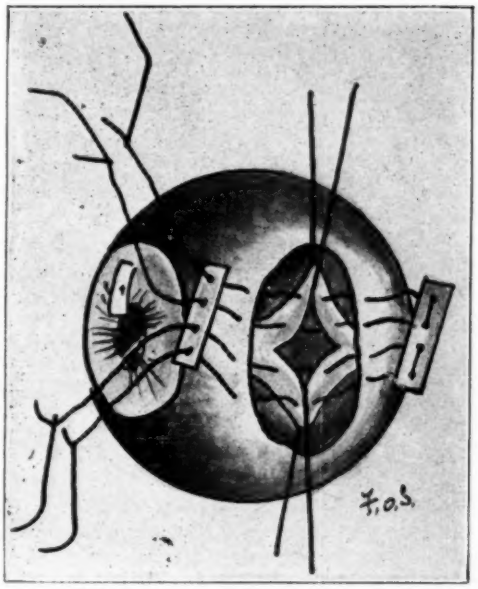

Fig. 4.—Shows sutures on plate passed thru the conjunctiva, looped muscle portions, thru the conjunctiva of the opposite side and then thru the second gold plate, ready for tying.

The needles of the previously described and prepared sutures are introduced thru the conjunctiva next to the posterior border of the incision (Fig. 3).

The split portions of muscle are

now held apart by two pieces of suture silk passed thru the cut and manipulated by an assistant. Gentle tension is made upon them to separate the two parts of the muscle in such a way as to have the pull directly at the center of each portion of muscle so that when the sutures are introduced in the next step, there will be an equal amount of muscle tissue on either side of the loop.

The next step is to pass the needles in their respective order thru the conjunctiva from its scleral surface to the outside at the anterior border of the incision and then thread them thru the second gold plate.

The sutures are now pulled up taut and the outermost one on either end is tied with the one immediately next to it. The plates should now be one

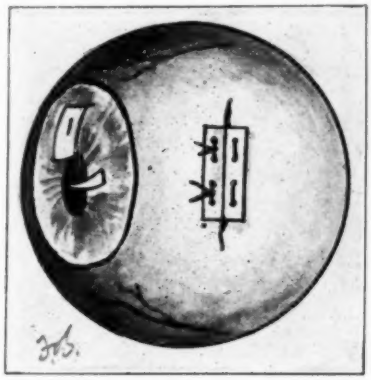

Fig. 5.—Final position of plates with wound closed and muscle shortened after sutures are tied.

There have now been formed, above and below two angles of rectus tissue, the degree of angle depending of course upon the pull exerted upon the silk, which is in the apex of either angle. The outermost needle, above or below, is now introduced thru the muscle near the apex of the angle and then thru the muscle tissue of the other side, at a point opposite to where it pierced originally.

The suture next to the above is put thru a similar procedure with the exception that it is introduced thru the muscle at a point near the beginning of the slit and pierces the tendon at its insertion.

The remaining two sutures are disposed of in the same manner, the outer one first, thru the other loop of muscle. next to the other, and exert an action similar to a clamp on the looped muscle. The silk threads, holding the muscle angles, are now removed by pulling one end of each. No further suturing of the conjunctiva is necessary. The roughened scleral surfaces of each loop have been approximated and are held in firm position by the sutures and plates. Both eyes are bandaged for eight to ten days, after which the unoperated eye may be left open, and the plates removed with their sutures twelve days after operation.

Both eyes may be left uncovered as soon as the conjunctiva has closed over, following the removal of the plates.

RETINAL ANGIOSCLEROSIS*

L. A. Copps, M.D.

MARSHFIELD, WISCONSIN.

The pathology and ophthalmoscopic appearances of angiosclerosis of the retina are here summarized. The significance of retinal vascular disease is brought out, and six illustrative cases are reported. Read before the Wisconsin Surgical Association, Marshfield meeting, May, 1921.

The distribution of angiosclerotic changes in the body is very irregular and uneven. Altho these changes may be found quite generally, they are frequently found closely limited to one or more organs or to one area, or even to a single vascular system within one organ; and when so found, are not to be regarded as a disease in itself of that part but as the local manifestation of a combination of general disturbances, all of which are not clearly understood.

The presence of sclerotic changes in the retinal vessel is therefore evidence of the existence of remote causes, and it is principally for its general diagnostic and prognostic value that the careful study of the retinal vessel is important.

ETIOLOGY.

Angiosclerosis is probably the result of no single agent; no age is exempt, altho it is rare in infancy and childhood and common in advanced age. It is more frequently encountered in men than in women, and in the muscular and hard working more than the feeble. It is a common accompaniment of syphilis, gout, rheumatism, diabetes, lead poisoning, and especially nephritis. As an etiologic factor, the now popular focal infection must be considered and, I believe, plays no small part by constantly feeding bacteria and toxins into the blood stream. Acute infections, especially typhoid, may be followed by vascular degenerative changes.

Arteriosclerosis and hypertension are usually found together, altho either exists without the other; however, where one exists alone, eventually the other makes its appearance. As to which is primary, there is some doubt, the prevailing opinion now being that high blood pressure precedes arterial changes, the latter being a compensatory or strengthening process against the increased intravascular tension. The fact that retinal angiosclerosis may be found in the absence of hypertension is evidence that the latter is not in all cases primary.

With advanced age vascular change is almost constantly found, probably the result of many factors; the amount of wear and tear to which the individual has been subject, his manner of living, number of infections, etc., and also the quality of arterial tissue he has inherited.

The three greatest causes of sclerotic changes in blood vessels are:

1. Intoxications.
2. High blood pressure.
3. Senility.

PATHOLOGY.

Pathologic changes. In practically all cases, disease of the retinal vessels, begins in the intima of the arteries, rarely in the veins. The earliest change according to Thoma[1] is a relaxation of the arterial walls due to a loss of elasticity and contractility. In the retina this results in an elongation, which is compensated for by tortuosity. This early relaxation is most manifest in the terminal vessels. The thinning of the vessel walls is soon arrested by a proliferation and thickening of the intima, and what Coats[2] considers a new tissue is found on the inner aspect of the elastica and encroaches upon the lumen in an uneven and eccentric manner; this tissue consists mainly of elastic fibers. The endothelial lining usually remains quite normal, altho there may be a proliferation of endothelial cells, which takes place very unevenly and results in the formation of nodes, which also encroach upon the lumen. It is probable that this endothelial proliferation at times takes place with very little

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other change in the vessel walls. As the condition advances, proliferative changes may take place in the muscularis and adventitia; and as in the intima, the new tissue is mainly elastic. As before stated, changes in the veins occur with few exceptions later than in the arteries and are essentially the same; in the last stages the new tissue becomes so abundant that it may completely obstruct the lumen. Degenerative changes intervene; the stroma takes on a hyalin appearance or may break down, resulting in the formation of cavities filled with granular debris and occasionally cholesterin crystals. The cells may become greatly swollen and molded together. These degenerative changes appear first and to the greatest degree in the outer layers and are accounted for by insufficient nourishment, the cells being cut off from the blood stream by the thick, proliferated, new tissue.

In considering the *ophthalmoscopic appearance* of retinal vascular change, one must constantly bear in mind that normally it is but the blood column that one sees; and it is only in abnormal or pathologic conditions of fairly marked degree that the vessel walls are seen.

The ophthalmoscopic picture of *hypertension* in the absence of arteriosclerosis is given by Bardsley[3] as follows: 1. The vessels have an appearance of uniform distension and fullness. 2. The light streak is broadened out, is much brighter than normal, the brilliancy increasing with increase of tension until it has a copper wire appearance (not silver wire as in sclerosis). 3. The tight arteries indent the veins.

Adams[4] lays great stress upon the following point: Where an artery crosses a vein in a normal patient, the light reflex of the latter is continuous practically up to the artery; but if the pressure is raised there is an absence of light reflex for some short distance up and down the vein.

The changes of *angiosclerosis* may occur in nearly all the retinal vessels, but perhaps more frequently, a single vascular system or even a single vessel may be diseased. The first changes are a dilatation, tortuosity and pulsation of the arteries. As a result of loss of elasticity and contractility of the artery walls, they become longer, broader and more flaccid, and the artery assumes a tortuous course. The pulsation is not always seen; it is not the type seen in glaucoma but is a slight lateral movement of the whole vessel and is most marked in the bends. This pulsation disappears later; but when seen in association with tortuosity, is almost pathognomonic of early arteriorsclerosis (Raehlmann[5]). The arterial light streak becomes broadened and brighter, taking on a silvery appearance. These early changes are first manifest in the terminal vessels, and small vessels which formerly were invisible come into view. This is especially noticeable on the disc where the distended capillaries give it an even redness; these capillaries, extending over the disc margin, may blur its outlines to a slight degree so that the combination of redness and obscured outlines may give the appearance of a very early papillitis. The change in the light streak, tortuosity, and pulsation may often best be seen in the macular artery which extends directly across the disc temporally to the macular region.

The thinning and relaxation of the vessel walls is soon arrested by the hyperplastic process described above, which begins the stage of vascular rigidity. The ophthalmoscopic features of this stage are as follows:

1. Changes in color of vessel. The arteries are lighter in color than normal and the light streak is brighter, broader, and extends unusually far into the periphery. When this brightness of the light streak is pronounced, the arteries are spoken of as "silver wire arteries."

2. Opacities in the walls. Opacities cause loss of transparency and visibility of the vessel walls. This is first and best seen where an artery crosses a vein; long before the opacity is visible an underlying vein is lost to view a short distance each side of the artery. As the opacities become more marked, the blood columns are bordered by

light colored lines which range from a semitransparent cloudiness to sharply defined white lines on each side of the vessel. These changes are most pronounced in the large vessels on the disc and must be differentiated from the congenital prolongations of connective tissue extended inward from the lamina cribrosa. Opacities as

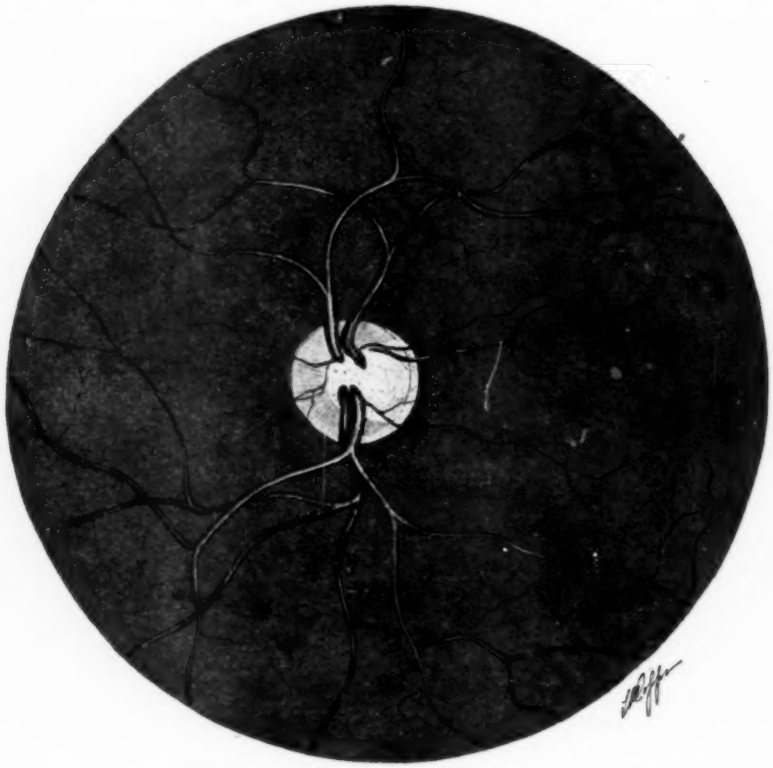

Fig. 1.—Ocular fundus in angiosclerosis, left eye of Case I. (See p. 816.)

dense as these, if caused by sclerosis, would almost invariably be accompanied by pathology of the vessels elsewhere in the retina.

3. Irregularity in the size of the blood column. As the proliferating intima encroaches upon the vessel lumen, it causes an uneven narrowing of the blood stream; this attenuation of the blood column is seen in the arteries and is very constant and, when associated with a reddened disc, is good evidence of angiosclerosis.

The normal ratio of artery to vein is given variably as 2 to 3, or 3 to 5. In arterio sclerosis it is 2 to 4 or less. There may be localized constrictions of the arteries, where the blood column is still further reduced; according to Raehlmann[5] these are due to nodular endothelial proliferations. (End-arteritis nodosa). Whereas narrowing is the rule with the arteries, dilatations are more common with the veins, the smaller venous twigs, especially, become distended, tortuous and apparently increased in number, and may have a corkscrew appearance. As the disease advances, there is a tendency for tortuosity to decrease in the arteries and increase in the veins.

4. Distortions at arteriovenous crossings. Normally, where an artery crosses a vein, the angle between them is not altered at the crossing. In the more advanced stages of sclerosis, the vein is diverted so as to lie along side of the artery for a short distance each side of the crossing. In the earlier

stages of sclerosis, the underlying vein is not indented but merely lost to view a short distance each side of the artery, as above described. As the artery becomes more rigid, it actually constricts the blood column in the vein so that it appears to be indented. This constriction leads sometimes to an ampulliform dilatation, just distally to the

Fig. 2.—Fundus of right eye Case 2. (See p. 816.) Macular artery very tortuous.

artery and frequently to tortuosity more distally. Due to flattening of the vein, there is a loss of its light reflex for some distance each side of the crossing. The pointed appearance, often seen, is an optical effect due to the gradual obscuring of the vein by the thick arterial wall. A condition called "banking" is not frequently seen; it is a damming back of the venous blood stream with consequent dilation of the vein distally and narrowing proximally.

5. Edema of the retina. Generalized edema is not commonly seen; but localized edema, especially about the disc, is not so uncommon. When present and associated with the redness of the disc above mentioned, it closely simulates in appearance papilledema; and when edema is present in the disc, there is an actual papilledema, which has no cause other than the vascular disease. Retinal exudate may be present in the form of small discrete white spots, usually not numerous, having no pigment disturbance. These may be grouped about the macula and may give the appearance of mild albuminuric retinitis.

6. Clouding of vitreous. This is a condition not described by most authors and may be dependent upon factors other than sclerosis, altho it is frequently found in the more advanced cases. It takes the form of a very fine haze over the disc and surrounding retina, obscuring the clear view of the vessels and accentuating

the red appearance of the disc, the latter at times appearing almost as red as the setting sun seen thru the low haze of a dusty summer day.

7. Retinal hemorrhage. Bleeding is not common in the early stages of sclerosis; but in the advanced, there may be small retinal hemorrhages, few in number, usually near the smaller veins, sometimes on the disc, and rarely at the macula. Less commonly, larger retinal or vitreous hemorrhages are seen.

8. Optic atrophy. With advanced arteriosclerosis, atrophy of the nerve may be seen; this may be due to insufficient nourishment because of endarteritis in the central artery or to pressure on the nerve of sclerosed ophthalmic or internal carotid arteries.

Fig. 3.—Fundus of right eye in Case 3 (p. 817). Upper veins greatly indented where arteries cross them.

SIGNIFICANCE OF RETINAL VASCULAR DISEASE

The importance of ophthalmoscopic changes in the retinal blood vessels, for the interpretation of general vascular disease and especially of cerebral vascular disease, cannot be over estimated.

In general arteriosclerosis, changes in the retinal vessels are frequently present. In 210 cases of arteriosclerosis, Raehlmann found retinal changes in nearly 50%. These findings check up quite closely with those of other investigators. Just as sclerotic changes may be found in a single vessel or vascular system in the retina, there may be a broader limitation to one or more organ or area in the body and we may have a fairly well marked sclerosis of the blood vessels in the brain before changes occur elsewhere; or the change in the cerebral vessels may be far in advance of any other. The angiosclerotic processes may be very irregular in distribution in this organ as in any. The ocular circulation must be regarded as a part of the

cerebral system, just as the nerve is a prolongation of the brain; and disease of the retinal vessels is very good evidence of the existence of the same condition in the brain. Due to the irregular distribution of sclerotic processes, any area of the brain or the whole retinal system may escape so that the absence of retinal vascular change is not proof of its absence in the brain. Knapp[5] says, "The presence of sclerotic changes in the retinal vessels presupposes with certainty a similar state in the cerebral vessels, but not the reverse."

Of seventeen cases of distinct retinal arteriosclerosis studied by Gies[6] death occurred in all from apoplexy within four years.

Of forty-four cases of cerebral thrombosis and hemorrhage reported by Foster Moore[7], 43% had advanced arteriosclerotic retinitis, 27% mild or moderately severe, and 30% had none.

Of seventeen cases quoted by Gunn, seven had moderate or severe retinal arteriosclerosis, three slight, and seven none.

Of one hundred and fifty-six cases of retinal sclerosis seen by Adams[4], the cause of death was definitely known in forty-nine; and of these twenty-two died of cerebral hemorrhage.

Fig. 4.—Left ocular fundus of Case 4 (p. 817). Great changes in vessels. Blood column narrowed in lower temporal artery. Veins full and tortuous.

These statistics leave no doubt as to the interrelation between vascular disease in the eye and the brain, and throw much light upon the prognostic significance of the former.

As to the significance of retinal hemorrhages, Knapp[5] says that when they are not due to local disease or other conditions, especially with increased blood pressure, they have serious prognostic significance.

The presence of a cloud or haze in the vitreous has indicated, in my experience, an increase of toxins in the blood stream; albumin is frequently

present in the urine. Energetic eliminative procedures result in betterment of vision and reduction of the haze.

The cause of "obscurations" is not determined, altho it is probably a vessel spasm. They may be the forerunners of permanent loss of sight.

In conclusion, I wish to present a few cases, more for their usual than unusual character. With the exception of Case II., the underlying conditions were found by first detecting the retinal changes. For the sake of brevity I have omitted the external ocular examinations.

Fig. 5.—Right ocular fundus, Case 5 (p. 818). Vitreous haze; nasal margin of disc blurred. Great vascular change.

Case I. Mrs. L. S. Age. 34. Housewife. Severe headaches, mainly frontal, but pain also at vertex and occiput. Headaches usually made worse by near use of eyes, but frequently present without. Has some pain every day. No severe illness. Works very hard. Three children. No miscarriages.

Eyes:—Disc normal. Narrow temporal conus. Arteries full, correspond in size with veins. No tortuosity, arterial light streaks broadened and unbroken, extending into periphery. Veins also full, light streaks brightened, not tortuous. Superior retinal artery indents nasal vein deeply; at other crossing there is less indentation, but venous light streak disappears some distance each side of artery.

Nose, sinuses negative. Tonsils slightly infected. Large goitre. Heart slightly hypertrophied. Lungs, abdomen, extremities negative. Urine normal. Blood chemistry normal. Blood pressure: systolic 240, diastolic 150.

Case II. T. K. age 34. Prize fighter. Elevated blood pressure found during examination before a fight. Has no complaint. Eats heartily. Works and trains vigorously.

Eyes:—Both discs distinctly red-

dened. Margins clear. Arteries narrow. (A:V::2:4) and tortuous. Arterial light streaks brightened. In the right, the macular artery is very tortuous; and the inferior temporal artery indents vein slightly. No pulsation seen. Veins full, venous light streak ends some distance each side of artery at crossings.

Fine general condition. Nasal septum thickened, sinuses negative (X-ray). Tonsils slightly hypertrophied and infected. Heart hypertrophied (electrocardiogram). Urine negative. Blood chemistry normal. Blood pressure: systolic 160, diastolic 110.

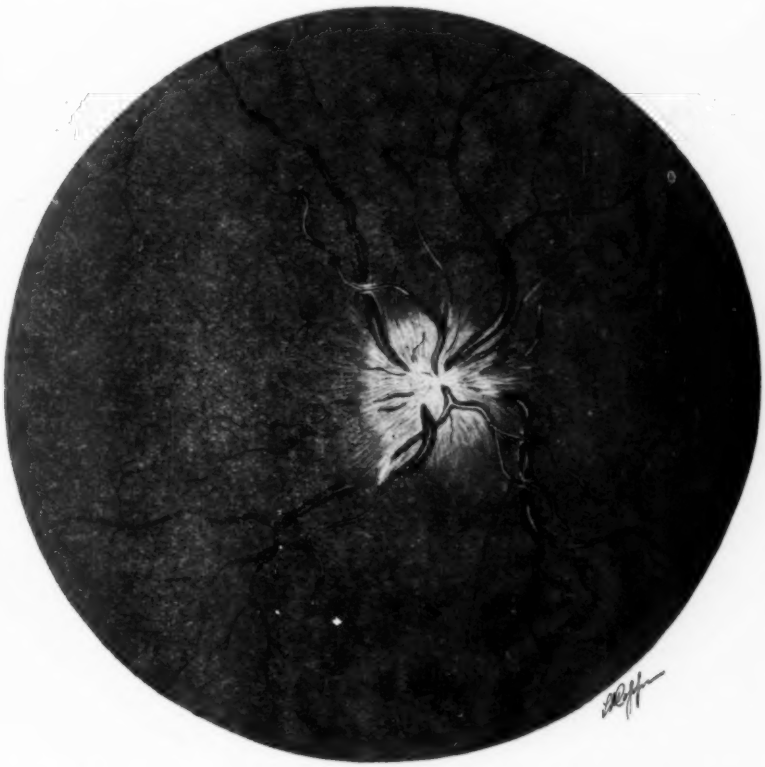

Fig. 6.—Fundus of right eye, Case 6 (p. 818). Disc margin blurred and disc protruding 1 D. Striking vascular changes.

CASE III. Mrs. W. H. age 46. Housewife. Complains only of feeling of irritation in left eye since having a foreign body in it three weeks previous. No headaches. Lower eyelid at times puffy.

Eyes:—Disc reddened, margins clear. Veins full and tortuous. Arteries pale, narrow (A:V::2:4) Arterial light streaks very bright (silver wire). In the right both superior retinal branches indent veins at crossings. Right inferior nasal artery very tortuous.

Blood pressure: systolic 150, diastolic 110. Urine: Trace of albumin and few hyalin cast.

CASE IV. J. M. age 60. Business man. Severe attacks of vertigo, come on when walking or exercising. Never falls, but thinks he will, feels very weak for an hour or more after each attack. Occasional mild headache. History, negative. Eats heartily. Drinks moderately.

Eyes:—Both fundi show marked vascular change, most pronounced in left. Left disc margins blurred, arteries narrow and very uneven in caliber, white opacities visible in walls, especially

where arteries cross veins and in inferior temporal artery, where in one place shortly distant from the disc, the blood column is reduced to a narrow thread. This artery deeply indents the inferior nasal vein which has an ampulliform dilation distally to the crossing. Veins are full and tortuous, especially the smaller branches. All vessels on the disc are bordered with white lines.

General: Full blooded, quite stout. Nose negative. A full dram of pus expressed from right tonsil. Heart, lungs, extremities negative. Urine negative. Blood pressure: systolic 146; diastolic 96.

Note:—This case is an excellent example of localized (undoubtedly cerebral) arteriosclerosis, far in advance of general vascular disease.

Case V. F. T. Age 52. Traveling salesman. Headaches, more or less constant, frontal and occipital, aching in neck, two months duration, altho much worse the last week. Blurring of vision two weeks. Past history: negative. Lives well, heavy eater. 4-8 cigars daily. No alcohol.

Eyes:—Both fundi much alike. Right: a very fine haze in the vitreous over and around the disc, cannot see vessel outlines clearly. Nasal margin of disc blurred and nasal ½ elevated slightly. Disc hyperemic. Arteries narrow, pale, tortuous, slightly uneven in caliber, have bright silver wire light reflexes. Veins large and full, also slightly tortuous and deeply indented by arteries.

Large man, weight 196 pounds. Full blooded. Urine: trace of albumin, no casts (this was constant in repeated examination). Blood pressure: systolic 214, diastolic 120. Blood Wassermann negative (2 tests) Spinal fluid negative. Perimetric field negative.

Note:—After brisk catharsis vision improved from 0.8 to 1.0 in each eye and headaches disappeared.

Case VI. Mrs. A. J. Age 38. Housewife. Attacks of vertigo, come on suddenly, usually when working. Headaches. Vision decreased last few months.

Eyes:—Both fundi similar. Left: Slight haze in vitreous over the disc. Disc margins much blurred and disc elevated one diopter. Arteries small, pale, and tortuous, bright silver wire light reflexes, arterial walls visible at venous crossings. Veins large and full, tortuous and deeply indented by arteries, this is very striking, nasally to the disc where two nasal arterial trunks cross a vein close together.

Large, well looking woman. Physical negative. Urine: trace of albumin. No casts. Blood pressure: systolic 180; diastolic 110. Blood Wassermann negative. Spinal fluid negative. Perimetric field normal.

1. Thoma. v. Graefe. Arch. f. Ophth. v. 35. 1889.
2. Coats. Trans. Ophthal. Soc. of the U. K. v. 33. 1913.
3. Bardsley. Brit. J. Ophth. v. 1. (April), 1917.
4. Adams. Brit. J. Ophth. v. 4. (July), 1920.
5. Raehlmann. Ztschr. f. Augenheilk. v. 7, p. 425. 1902.
6. Geis. Klin. M. f. Augenheilk. 49. 4. 1911.
7. Foster Moore. Quart. J. Med. 10.
8. Knapp. Med. Rec. 87.

EYE FINDINGS IN BRAIN INJURIES

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This paper brings together a summary of the ocular conditions likely to be found in connection with brain injuries with some mention of other symptoms frequently associated with them. It was read before the Wisconsin Surgical Association, at the Marshfield meeting, May, 1921.

The ocular changes attendant upon injuries to the head and brain are important factors, when studied in conjunction with the general symptoms, in estimating the extent of the injury, in aiding in localization and in determining the treatment.

Their manifestation may result from: increased intracranial pressure, from actual destruction of, or injury to the cortical visual centers or the visual tracts, or from general or localized meningitis or cerebral infections. The extraocular expressions of these injuries are muscular paresis, paralyses and conjugate deviations. The intraocular are choked disc, optic neuritis and retinal hemorrhages of all grades.

The visual center and tract manifestations are expressed in defects of the visual fields varying from small unilateral scotomas to bilateral total loss of the fields or blindness. It is deemed inadvisable in this paper to attempt any discussion of the ocular findings from war injuries of the head and brain. Mention will be made only of those cases which possibly parallel industrial or civil brain injuries.

The advance made in the knowledge of cerebral localization as a result of the number and variety of war wounds of the head and brain will be of great assistance in the localization and treatment of civil brain injuries.

Nystagmus may result from injury to the occipital region probably due to the nearness of the labyrinth, the cerebellum and medulla. This symptom however, is not common except in penetrating wounds of the brain. Nystagmus has also been observed following war injuries of the parieto-frontal region and can only be understood on the ground of direct injury to the frontal center of coordinate movement. There seems to be no uniform relation between the direction of the ocular movement and the side injured. Nystagmus as a rule disappears either spontaneously or after operation.

Disturbances of motility are rather infrequent following brain injuries, and are rarely permanent. The abducens and trochlearis are most frequently affected. The impaired or lost function may be due to fracture of the base; to basal meningitis or hemorrhage; but is generally considered as due to marked rise of intracranial pressure.

Holmes and Sargent[1] remark on the comparative rarity of ocular palsies in gunshot wounds of the head; an exception being those cases of wounds of the sinuses and particularly wounds of the superior longitudinal sinus and its tributary lacunae. Injuries of this character are much less common after thru and thru perforations than after tangential wounds with depressed fracture, or fissures of the skull in the mid line.

In these cases Holmes and Sargent attribute the symptoms wholly to circulatory stasis, the result being profound cerebral edema from occlusion by thrombus, or by pressure of depressed bone, of the intermediary channels between the sinus and the superior cerebral vein. The remarkable tendency to recover, in uncomplicated cases, is probably due to the free venous anastomoses.

The value of the pupil as a factor in the diagnosis of brain injuries has been greatly overrated as the appearance and activity vary greatly depending upon the nature and location of the trauma of the brain.

There is usually miosis early, the result of the concussion, followed by mydriasis. Aniscoria may be present or there may be miosis if there is hemorrhage into the pons, cerebellum or ventricles. Occasionally hippus may be present and, rarely, Argyll-Robertson pupils. The reaction to light is fre-

quently sluggish. The Wernicke reaction test is beautiful in theory, very difficult to properly apply and, according to Walker, "there is no evidence that the hemiopic pupillary reaction has any topical value."

Horsley considers that mydriasis, in cases of traumatic brain pressure, occurs immediately when the intracranial pressure exceeds the blood pressure and depends upon; (1) a central conditional stimulation of the sympathetic; (2). a simultaneous diminishing of the sensitiveness of the oculomotor.

It is only within the last decade that the appearance of the eye ground, as revealed by the ophthalmoscope, has been utilized as an index of intracranial tension. Investigation and research have determined that thru the eye we have two valuable means in diagnosing increased intracranial tension, i. e., the condition of the eye grounds and the character of the visual field as determined by the perimeter. As a result no examination of a case of suspected brain lesion is complete without a thoro examination of the ocular fundus and a determination of the visual field.

There is a diversity of opinions as to the pathogenesis of the intraocular changes found in increased intracranial pressure. All, however, hinge on the toxic, the inflammatory and the mechanical theories.

Schulten, Bramwell, Oppenheim, Hoche, Merz, Brau, Cushing, Bordley, Uhthoff, Axenfeld and Kampfferstein all practically agree on the mechanical theory.

The inflammatory theory is upheld by Leber, Deutschmann, Knies, Gower, Elschnig, Jacobson and Flemming.

Relative to the pathogenesis of choked disc de Schweinitz says "in general terms it is probable that choked disc is produced by a combination of factors. In this combination increased intracranial tension or pressure is most prominent, and *the mechanical theory of its pathogenesis affords the most satisfactory explanation.*"

The intraocular changes seen after head injuries are frequently found within a few hours following the trauma, and can hardly be explained on any other hypothesis than the mechanical theory. Even in those cases in which the changes in the eye grounds do not make their appearance for several days the mechanical theory holds good.

Further, in cases of brain injury accompanying basal fractures with free outlet of the fluids in the skull no visible changes as a rule take place in the eye ground as long as the drainage is maintained. This was not the rule in war injuries as a large percentage showed papilledema or optic neuritis at some stage of their existance. This is easily accounted for by the greatly increased trauma to the brain tissue in war wounds.

It is a noteworthy fact, that in many cases of intracranial injury with marked general symptoms, there will be no visible changes in the eye grounds; again, the ocular manifestations will differ in the two eyes. The same rule applies in cases of neoplasms of the brain, choked disc being found in only about 80% of brain tumors. No satisfactory explanation has been offered to account for this fact,

It has occurred to the writer that a possible explanation may be found in the results obtained by Parker[2] in his experimental work on "The Relation of choked disc to the tension of the eyeball."

May it not be possible that in cases of brain injury with marked general symptoms, in which no changes are manifest in the eye grounds, the intraocular tension is sufficient to counteract the effects of the intracranial pressure?

Another possible factor may be the location of the injury in the brain substance. It is well known in cerebral neoplasms, that the tendency of tumors to produce choked disc increases from the anterior to the posterior pole of the brain and diminishes from the cortex inward. Thus the topographic location of the injury may be a determining factor as to whether or not changes will take place in the eye grounds.

The age of the individual may have

some influence in intracranial injuries, as it is an important factor in brain tumor choked disc; youth being much more liable to intraocular changes than age. This may be due to the fact that the ocular tissues are less yielding in age than in youth and therefore may be a factor in resisting the mechanical effects of the intracranial pressure.

Parsons[3] states "any intracranial condition which impedes the flow of blood in the internal carotid may be expected to lead to passive constriction of the intraocular arterioles; but such intracranial conditions usually affect the venous sinuses even more profoundly, leading to partial blockage, with coincident slowing of the circulation. This latter effect, however, will not necessarily lead to increased ocular venous pressure, owing to the free communication with the general system of veins, which themselves anastomose so freely as to tend rapidly to the equilization of pressure." It is not without the bounds of reason to suppose that in certain individuals there may be an anomalous more free communication between the external carotid and the vascular supply of the eye, as in the lower animals, which will overcome the effect of intracranial pressure on the internal carotid in leading to passive constriction of the intraocular arterioles.

Bollack[4] in a recent article possibly throws some light on the subject in the statement, that the anatomic findings and the clinical facts show the constant presence of ventricular hypertension and dilatation in the course of tumors accompanied with choked disc; and that dilatation of the third ventricle is always followed by choked disc while dilatation of the lateral ventricles is only occasionally so followed; and that tumors situated in the posterior portion of the brain and in the cerebellum in particular are most apt to cause dilatation of the ventricles.

In other words Bollack concludes that with the intimate embryologic, histologic and anatomic connections between the third ventricle and the chiasm, ventricular dilatation plays an important role in the production of intraocular changes. He also states that ventricular hypertension is the cause of ventricular dilatation, but that the latter has not necessarily any connection with intracranial hypertension, altho it undoubtedly plays an important part in the origin of the syndrome in which choked disc is a symptom. Supposing such to be the fact, it is probable that certain brain injuries with increased intracranial tension would not cause sufficient hypertension and dilatation of the ventricles to be a factor in producing intraocular changes.

Why increased intracranial pressure, per se, does not always make itself manifest in intraocular changes is an interesting problem to ophthalmologists. In the great majority of instances it is certain that after decompressive measures in those cases with choked disc and the general symptoms of increased intracranial tension, there is a marked change in the appearance of the eye grounds, which, if the pressure has not existed too long, may resume their normal appearance.

The intraocular changes observed by the writer in cases of brain injury have rarely reached the third stage of choked disc but have usually been those of the first or second stage. The few exceptions were seen during the war. These were peculiar in that they were furrow wounds of the scalp with the outer table of the skull intact and were usually of the vault. No operative treatment had been given other than *débridement* of the original wound.

There were the symptoms of increased intracranial tension but the surgeons decided against operation on the ground that there was no depressed fracture, X-ray findings were negative, the symptoms were not alarming and visual acuity was not affected. Examination of the eye grounds showed marked evidence of choked disc, with swelling varying from 1 to 3 D. Operation was advised and on opening the skull it was found that the inner table of the skull was comminuted, under the furrow made in the scalp by the bullet, for a distance of 1½ to 2 fingers width with marked breaking down

of the brain tissue, altho the dura was intact.

It was not my fortune to follow up these cases as they were evacuated too promptly, but it is presumable that there was a recession of the choked disc after operation.

Jessop[5] calls attention to the large proportion (72% in 47 cases) of patients showing choked disc with gunshot wounds of the vault of the skull. The swelling of the discs in most cases was slight, generally 1 D., seldom more than 2 D. Both discs usually affected and other ocular symptoms rarely present, color sense and visual fields intact. On relief of intracranial pressure the eye changes subsided in 5 to 6 days.

The visual fields for form and color under normal conditions have a fixed relation with each other, the white or form field being the largest, the blue next in size, followed by the red, the green being smallest.

The fields of vision in brain tumor differ with the situation of the lesion and vary with the increase and decrease of pressure. Fields taken daily by the same observer show marked daily variations. This variation in the fields is also observed in head injuries, depending upon changes in intracranial tension, due to pressure from blood clots or edema of the brain tissue. Following contusions, especially tangential in character, as bullet wounds, and penetrating injuries over the occipital poles of the brain in which there has been laceration or actual destruction of the brain tissue, all manner of transitory and permanent defects in the visual fields will be found.

Mills[6] states the striking feature of occipital injuries is that the principal defect is visual rather than nervous. Immediate unconsciousness, of momentary or of considerable duration, follows the injury, but when control returns, blindness of all degrees remains. Unless there has been a direct bilateral lesion of both visual cortical centers, the early more or less complete blindness which follows so many of these occipital injuries resolves into one or another form of hemianopsia, or, as in a few cases, into complete restoration of vision, without discoverable defects in the visual fields. In these cases of initial total or relative blindness, the later restoration of vision depends upon the subsidence of the constant reactive edema of the contused cortex or subcortex, the absorption of cortical capillary hemorrhage, the contraction and organization of meningeal clots, or it may be explained on v. Monakow's last theory of diaschisis. According to Jessop[7] in this conception the shock of the injury to one side of the occipital area of the brain is transmitted by commissural fibers to the corresponding area on the opposite side, as each area represents the cortical projection of half the field of vision in each eye, the immediate effect is blindness. When the shock and its physical effects pass off, the center on the side opposite to the lesion generally recovers completely, leaving permanent and usually more or less symmetric residual defects in the visual fields.

Genet[8] who made a systematic examination of all projectile wounds of the head during the war, regardless of their degree, concludes that determination of the visual fields is necessary in all cases of occipital trauma, regardless of their apparent triviality, as a large proportion of field defects will only be discovered when sought. The fields should be examined frequently in cases of hemianopic scotoma as the increasing size of the field defect may be the first indication of the pressure and enlargement of an occipital abscess.

Under civil accident neurosis we find:—First, fields that represent true hysteria or neurasthenia features connected with cases in which there may be no actual disorganization of tissue but representing a psychic, hysteric or neurasthenic element induced by the accident itself. Second, fields that in the eye itself, or in other parts of the same apparatus, represent some demonstrable or nondemonstrable lesion.

In cases where the eye changes show the 2nd and 3rd stage of choked disc

there will be found enlargement of the blind spot from impingment of the swollen tissue on the nerve fibers contiguous to the disc. Central visual acuity is rarely permanently affected in the brain injuries occurring in civil life. The exceptions being in those cases of injury to the occipital region in which depressed fractures or clot pressure inhibit the cortical visual centers. Restoration of function is usually complete upon relief of pressure.

Cortical blindness is the direct result of a bilateral lesion of the visual cortical centers, usually a perforation of both centers by a bullet. It usually persists unmodified, and if vision of any sort remains or returns, it seldom exceeds a vague sense of luminosity or at best an exceedingly contracted field of distinct vision.

The above described ocular findings are frequent as manifestations following brain injury. But as above stated choked disc may be absent thruout the entire course of a cerebral lesion with marked objective symptoms.

Examination of the eye grounds should always be a part of the routine of the examination of any case of head injury, and the determination of the visual fields when possible. When choked disc is found together with other symptoms of increased intracranial tension, operative interference is imperative. The relief of pressure in practically every instance prevents consecutive atrophy of the optic nerve when done in time. The finding of the symptoms of choked disc without other symptoms of intracranial pressure is not sufficient indication for operation, unless the intraocular manifestations are progressive in character; on the other hand the absence of choked disc should in no wise preclude operative interference when other symptoms indicate its necessity.

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CAUSES AND PREVENTION OF BLINDNESS

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This statistical study of the causes of blindness is made from a wide range of material and several different points of view. The various causes are also discussed from the practical standpoint of guarding against them. Read before the Section of Ophthalmology of the British Medical Association at Newcastle, July, 1921.

We need a sound knowledge of the causes of blindness else we cannot take effective steps to prevent blindness. We need to prevent blindness because of the cruel hardships it entails upon the blind person, and because a blind person is directly or indirectly a heavy charge upon the resources of the community. To present a true picture of the causes of blindness we should need a recurring census of the blind taken by expert practitioners. Failing that, I present figures which will, I think, give such a fair impression of the causes as to allow of just deductions as to the measures for prevention. My figures come from three sources; (1) A home for blind infants; (2) the schools for the blind and partly blind of the London Education Committee and (3) private case books. They relate to 4,288, patients in all.

BLIND INFANTS

The home for the blind infants is under the care of the National Institute for the Blind. It has only been recently opened. So far there have been presented for examination sixty-three babies. They come from all parts of the country, all are quite young, mostly babies in arms. The causes of blindness found may be grouped under: I, surface inflammations, II, inflammations within the eyes, III, congenital defects.

Group I, *Surface Inflammations of the Eyes,* contains 36 cases. Of these 31 are due to ophthalmia neonatorum, and 5 to purulent conjunctivitis of later months. Of the 5 latter cases, one lost the sight during the third week of life; the cause is not known, but from the history I should judge that there had been a streptococcal infection and a particularly destructive inflammation. Scarlet fever, diphtheria and measles accounted for one each, and one was due to an unknown cause.

Group II, *Inflammations Within the Eyes,* contains 7 cases. Two were due to iridocyclitis of great severity, one to cerebro-spinal meningitis, and the other probably to the same disease. Five were due to optic atrophy or defect; one followed meningitis; another probably arose from the same cause, for there is no hydrocephalus; two appear due to intracranial defect, and one to a cause unknown.

Group III, *Congenital Defects.* The cases number 19; the conditions are as follows:

Anophthalmia	2
Microphthalmia	4
Microphthalmia with congenital cataract	3
Congenital cataract	3
Albinism	1
Nystagmus	1
Buphthalmia	1
High myopia	1
Malignant disease (glioma)	2
Defect of the cornea	1

The cataracts have been operated upon, but at best vision will be very poor. The case of high myopia is of interest; in the right eye myopia is 12 D., left 5 D., there is rapid nystagmus, fixation is doubtful; the myopia was found to exist at the age of nine months.

There is one case of blindness due to accident, the child was burned, and both eyes were lost.

TABLE OF BLINDNESS.

Cause	No.	Percentage
Purulent conjunctivitis (36):		
Ophthalmia neonatorum	31	49.2
Of later months	5	7.94
Inflammations within the eye.	7	11.11
Congenital defects	19	30.14
Accident	1	1.6
Total	63	100

BLIND OR PARTLY SIGHTED SCHOOL CHILDREN.

For the past seventeen years I have had oversight of a number of London

schools for the blind. There are six day centers for the blind accommodating 211 children and two resident schools for the older children accommodating 116. There is a large and growing provision of "myope classes" for the partially sighted in thirty-three centers, accommodating 660 children. Prior to the admission of a defective child the state of the eyes and the body of the child is ascertained and recorded. During the period of attendance at school the eyes are examined periodically, so that there is ample opportunity for the revision or confirmation of the diagnosis. The total number of blind and partially sighted children brought into this inquiry is 3,300. The conditions responsible for their state may be placed in four groups:

I. Injury or destruction of the cornea consequent on surface inflammations.

II. Inflammation within the eyeball or optic nerve.

III. Congenital defects of the eyes.

IV. Myopia.

GROUP I, *Surface inflammations,* contains 699 children, and the causes of blindness are as follows:

	Blind	Partially Sighted	Total
(*a*) Ophthalmia neonatorum	299	68	367
(*b*) Purulent conjunctivitis of later years	69	21	90
(*c*) Phlyctenular keratitis	66	176	242
			699

(*a*) Ophthalmia neonatorum is responsible for by far the greater number of cases of blindness, and in particular for cases of total blindness.

(*b*) The cases of purulent conjunctivitis occurring in later months or years of child life were due to a great variety of causes, as follows:

Date of origin known, but actual cause not ascertainable	30
Eczema and streptococcal infections	7
Scarlet fever	8
Measles	18
German measles	1
Meningitis	6
Diphtheria	3
Erysipelas	1
Pneumonia	2
Gonorrhea	2
Small pox	4
Chicken pox	1
Whooping cough	2
Trachoma	4

The two cases of gonorrheal conjunctivitis demonstrate the danger to other members of the community of babies suffering from ophthalmia neonatorum. One is a girl whose motherliness was exercised towards an affected baby; she caught the disease, the corneae ulcerated, and she is blind for life; the baby died. The other is a member of a family of three girls; the youngest, a baby, had the disease, the whole family contracted it, besides suffering from vaginitis; the eyes of one of the children were damaged sufficiently to necessitate her being educated in a blind school.

(*c*) Amongst the cases of phlyctenular keratitis were 60 showing active nose, ear, or throat trouble, and 8 with tuberculous lesions.

GROUP II, *Inflammation Within the Eyeball.* This group contains a great variety of cases—inflammations of the cornea, of the iris, of the choroid, and of the optic nerve, but it is convenient to place them in two categories, according as the inflammation affected (*a*) the anterior half of the eye, or (*b*) the posterior half of the eye. The distinction is arbitrary but convenient.

(*a*) Those affecting the front half of the eye total 413 cases, of which 284 were blind and 129 partially sighted. By far the greater number are due to interstitial keratitis of congenital syphilitic origin; there are a few only of iritis or irido-cyclitis.

Interstitial keratitis—	
Due to congenital syphilis	362
Evidence of syphilis not certain	24
Due to tubercle, etc.	13
Iritis or iridocyclitis—	
Due to congenital syphilis	7
Evidence of syphilis not certain	5
Due to cerebro-spinal fever	2
	413

(*b*) Of those inflammations affecting the posterior half of the eye by far the greater number were due to a form of choroiditis known as "disseminated." This condition cannot be said to be diagnostic of syphilis, for other conditions are capable of causing the same or very similar conditions, but all the evidence goes to prove that these cases in children are overwhelmingly syphilitic in origin. With the choroiditis there is always more or less atrophy of the retina,

and of the optic nerve, so that vision is gravely impaired. Closely associated with these cases are many cases of total optic atrophy.

This group includes 349 cases, of which 294 were blind and 55 partially sighted. Of these, 210 were definitely the subjects of congenital syphilis.

1. Disseminated choroiditis with or without optic atrophy:
   - Of syphilitic origin 210
   - Syphilis not certain 19
2. Disseminated choroiditis or optic atrophy of which the cause was assigned to other effects than syphilis, or of which the cause was indeterminate:
   - Optic atrophy without choroiditis, cause unknown 39
   - Ditto, postfebrile (scarlet fever 1, measles 1, diphtheria 1, influenza 1, unknown 12) 16
   - Ditto, following head injuries 4
   - Ditto, following meningitis 20
   - Ditto, following cerebro-spinal meningitis 6
   - Ditto, with grave mental defect 13
   - Optic atrophy, familial 7
   - Choroiditis, familial 4

(c) There is a small group of 157 cases which falls more or less into this main second group.

- Injuries 43
  - Blind from sympathetic ophthalmitis 29
  - Partially sighted—one eye lost, other defective 14
- Buphthalmia or congenital glaucoma 17
  - Blind 14
  - Partially sighted 3
  - Honeycombed teeth 5
  - Hutchinsonian teeth 2
- Macular defects 37
  - Blind 32
  - Partially sighted 5
  - Congenital colobomata 11
  - Deficiency 13
  - Day blind 12
  - Some evidence of syphilis 5
- Congenital nystagmus (not including those with myopia) 58
  - Blind 17
  - Partially sighted 41
- Double detachment of retina, cause unknown 2
- Retinitis pigmentosa 39
  - Blind 34
  - Partially sighted 5
  - Sporadic cases 23
  - Familial cases 14
  - Sole child cases 2
  - Evidence of syphilis 3
  - Deaf mute 1

GROUP III, *Congenital Defects*, contains 408 cases of great variety and interest. For the most part it is not possible to discover to what primary causes these congenital defects are due. Some few are hereditary—that is to say, the same defect is found repeated in the same family for two or more generations. This is particularly true of certain forms of cataract. Numerous pedigrees of this order have been published. The majority of these defects are, however, sporadic; they may appear in families whose other members are quite normal. In some instances there is a definite history of illness on the part of the parents, particularly of the mother before or during pregnancy; in some there is evidence of a syphilitic infection. Some few parents who are abnormal from one form of physical defect have produced children who suffer from another form of physical defect—for example, a father and mother both deaf and dumb but with good eyes have a family of five, of whom two are partially sighted by reason of congenital dislocation of the lenses.

- (*a*) Albinism (blind 36; partially sighted 33) 69
  - Familial cases (syphilis 1) 22
  - Sporadic cases (syphilis 2) 47
- (*b*) Defects of the crystalline lenses (blind 170; partially sighted 78) ... 248
  - Microphthalmia and cataract (syphilis 2) 18
  - Ditto, hereditary 9
  - Microcephaly and cataract (syphilis 2) 10
  - Posterior polar cataract (syphilis 4) 22
  - Congenital cataract, varied types (syphilis 13) 101
  - Lamellar cataract, postnatal syphilis 3) 57
  - Dislocated lenses, congenital (syphilis 1) 31
- (*c*) Varied defects of the globes and the accessory organs of vision (blind 66; partially sighted 25) 91
  - Aniridia 10
  - Coloboma of iris and, or choroid 27
  - Microphthalmia 25
  - Congenital anophthalmia 3
  - Glioma retinae 3
  - Defective muscles 2
  - Defective muscles and face 3
  - Extreme hypermetropia 4
  - Oxycephaly 11
  - Conical cornea 2
  - Hereditary corneal opacities 1

(No evidence of syphilis in this subgroup.)

GROUP IV, *Myopia*. The degree of myopia cited is the mean of the four meridians of the two eyes—for ex-

ample, —10 D. sphere with —3 D. cylinder in one eye, with —8 D. sphere and —6 D. cylinder in the other, give a mean of 11 D.; this is the only convenient way of summarizing such cases, altho the method has the disadvantage of not showing the additional defect of vision caused by a high degree of astigmatism.

CASES OF HIGH MYOPIA

Complicated cases producing blindness more or less severe	34
Myopia with nystagmus, vision very bad	20
Myopia 5 to 10 diopters	509
Myopia 10 to 15 diopters	592
Myopia 15 diopters and over	80
Total	1,235

No evidence of syphilis in the group; there are a number of cases of myopia with interstitial keratitis and disseminated choroiditis of syphilitic origin; these are counted with the latter diseases.

Summary of School Cases.

The provision of myope classes, and the knowledge of their provision by the extended school medical service and by the hospital surgeons, has led to the report of many cases of defect which in earlier years would never have come under review. The new conditions prevent the comparison of this return with my previous statistics[1] in the gross: some adjustment is needed to bring them into reasonable relation. I propose, therefore, to adjust these latest returns so as to put them into as nearly the same position as those of former years, and in doing this to take into particular account the future prospects of the children.

In the table that follows the words in brackets (all) or (bad) which succeed the name of the condition or disease producing blindness indicate whether the total number of those so affected are included in the count or only the worst cases, such as myopes who could not be dealt with in myope classes because of the gravity of their defect.

1913 and 1920.—The difference between the returns of these two periods is clear when the percentages of the four main classes are set out.

Disease	1913	1920	Rise
Congenital defects	25.06	27.13	2.07
Ophthalmia neonatorum	24.17	19.79	—4.38
Syphilitic inflammation	29.70	31.43	1.73
Miscellaneous	20.47	21.65	1.18

It would appear that the fall in the percentage of cases of ophthalmia neonatorum is a real fall, and that the apparent small increases of the three other groups are merely proportionate increases due to the fall in the second factor.

Tabular Statement of Causes of School Blindness, with Comparison between 1913 and 1920.

Disease	No.	Percentage 1920	Percentage 1913	Gonorrhea	Syphilis	Syphilis not certain
Ophthalmia neonatorum (all)	367	19.79	24.17	367	...	...
Purulent conjunctivitis of later years (all)	90	4.85	4.27	2	...	...
Phlyctenular keratitis (bad)	66	3.56	3.45	...	...	...
Interstitial keratitis (all)	399	21.51	19.18	...	359	24
Irido-cyclitis (all)	14	0.76	0.54	...	7	5
Optic atrophy with or without disseminated choroiditis (all)	349	18.81	20.18	...	212	19
Buphthalmia (all)	17	0.92	1.54	...	5	2
Sympathetic (all)	29	1.56	1.45	...	...	...
Macular defects (all) with congenital nystagmus (bad)	55	2.91	2.09	...	5	...
Retinitis pigmentosa (all)	39	2.10	1.81	...	3	...
Detached retina of both eyes, cause unknown	2	0.10	...	...	...	...
Albinism (bad)	36	1.94	2.27	...	2	...
Lens defects (all)	248	13.37	12.90	...	25	...
Other congenital defects (all)	91	4.90	4.81	...	...	...
Myopia (bad)	54	2.91	1.18	...	...	...
Totals	1,855	100.00	...	369	618	50
Percentages	....	....	...	19.89	33.31	2.69

BLINDNESS IN 925 PERSONS OF ALL AGES AS ASCERTAINED IN PRIVATE PRACTICE.

The desirability of securing data of blind persons of all ages led me to investigate a series of my own private cases. Some 5,000 were examined seriatim. The patients were of all classes—well-to-do, middle class, and some artisan, with an inclusion of a certain number of persons, mainly of the working classes, referred for examination and report by the National Institute for the Blind. This inclusion perhaps swells the number of the blind beyond the usual for private practice. The patients were of all ages, and, as may be expected, adults were in the majority; 925, or about one-fifth of all these patients, were blind or partly blind in one or both eyes; 603, or about one-eighth, were blind or partly blind in both eyes.

The degree of defect of the sight is noted in five columns, as follows: 1, One eye defective. 2, One eye blind. 3, Both eyes defective. 4, One blind, one defective. 5, Both blind.

In taking the totals and percentage only those in the last three categories are included. Categories 1 and 2 are given for purposes of comparison, but are not included in the count.

Some notes may be added on the several categories of disease or injury causing blindness.

Accidents.—It is noteworthy that casual accidents, occurring in civilians in their ordinary life and unconnected with their occupation, accounted for just twice as many cases of damaged sight as did industrial accidents (casual 54, industrial 27). For the most part the casual accidents destroyed one eye only, the other remaining healthy, so that most of the patients were able to carry on with their usual occupation. The severe cases followed by blindness numbered 10, nearly the same as the industrial 9. There were 3 cases of sympathetic ophthalmitis after casual accidents and the same number after industrial. War cases were few in number, probably owing to the special arrangements made for blinded soldiers. Injuries at birth head list of individual cases of casual blindness and number 7. In children, missiles, whether thrown by hand or discharged from some form of toy gun or catapult, were most prolific cause of loss. In later years amateur wood chopping accounted for more cases than any other single cause. The variety of other causes responsible for loss was very wide. There were two cases of lost eyes from injury by broken spectacles; one boy ran into a gatepost in a fog, and one woman stooped in a dark room and struck against a chair back; in each case a spectacle lens was broken and driven into the eye. Considering the large number of persons of all ages who habitually wear glasses, these accidents are remarkably few, and they are probably more than counterbalanced by the cases where spectacles have saved eyes from direct injury. The causes of industrial accidents were also very varied:

Decarbonizing motor cylinder, 1; waiter injured by sodawater bottle cap, 1; engine gauge burst, 1; blow lamp burst, 1; driving belt break, 1; stonemasons, 2; caustic splashes, 2; acid splashes in process block making, 3; laboratory worker, acid splash, 1; borax scale in brazing, 1; rivet, 1; tin strip, 1; grindstone burst, 1; steel splinters in lathe workers, 4; explosion in cartridge factory, 1; coal miner, 1; thorns in gardening, 3; septic tooth (dentist extracting tooth), 1.

Of these 27 cases, at least 10 belong to the preventable order—that is, the stonemasons, process workers, steel workers, and cartridge maker; the last named accident was caused by a direct breach of the factory rules.

Conjunctivitis.—Only one case of direct infection of the eyes by gonorrheal discharge in an adult was found; the rarity of this severe affection compared with the frequency of urethral gonorrhea is remarkable. The trachoma cases were mostly old cases where the disease was arrested but the sight badly damaged.

Corneal Diseases.—Of all forms of diseases of the cornea responsible for blindness, interstitial keratitis, with or

Disease	1	2	3	4	5	Total Cases	Per Cent
Congenital defects						34	5.64
Dermoid of cornea	..	1	..	..	..		
Coloboma of uvea	..	..	..	1	..		
Albinism	..	..	..	..	1		
Nystagmus, macular defects	..	..	3	2	2		
Microphthalmia	..	..	..	..	2		
Dislocated lenses	..	..	1	1	3		
Lenticonus	..	..	1	..	..		
Cataract, various	1	4	4	4	6		
Cataract, lamellar	..	..	4	1	..		
Accidents						20	3.32
Casual in civil life (birth 7)	5	39	..	4	6		
War	..	6	..	..	1		
Industrial	3	15	2	4	3		
Purulent conjunctivitis						34	5.64
Ophthalmia neonatorum	..	3	1	3	10		
Later years (gonorrheal)	..	6	2	..	9		
Trachoma	..	..	8	..	..		
Essential shrinking	..	..	..	..	1		
Corneal diseases						51	8.46
Conical cornea	4	..	6	1	2		
Superficial keratitis	2	6	6	2	1		
Hypopyon keratitis	..	2	..	2	..		
Interstitial, syphilitic	..	4	3	11	10		
Interstitial, tubercle	1	..	..	2	1		
Interstitial, leprosy	..	..	..	1	..		
Sclerosing keratitis	..	1	..	..	3		
Cataract, senile	4	6	44	28	17		
Cataract, diabetic	..	..	1	1	3	94	15.09
Iritis and irido-cyclitis						56	9.29
Syphilitic	1	5	1	3	11		
Various (with tubercle 6, gonorrhea, 5, cerebrospinal 2)	2	22	11	17	13		
Vascular diseases						49	8.12
Vitreous hemorrhages	..	1	..	..	1		
Embolism, thrombosis	..	6	..	1	1		
Retinitis, renal	2	4	3	5	11		
Retinitis, diabetic	..	..	3	3	7		
Retinitis pigmentosa	..	..	5	2	..		
Detached retina (10 with myopia less than 10 D.)	..	11	..	6	8	14	2.32
Choroiditis						77	12.77
At macula	1	13	3	3	6		
Central senile	2	4	17	9	13		
Disseminated, syphilitic	2	2	1	2	12		
Disseminated, other causes	..	1	2	1	8		
Optic atrophy						38	6.3
Various causes (syphilis 6)	..	7	5	2	11		
Leber's	..	..	..	..	2		
Tabes	..	..	1	2	8		
Pituitary disease	..	3	2	..	..		
Hemianopia	..	..	4	..	1		
Glaucoma						55	9.12
Buphthalmia	..	..	..	4	2		
Chronic glaucoma	3	3	13	12	12		
Acute glaucoma	1	5	2	4	6		
Malignant	..	2	..	..	2	2	0.35
Myopia over 10 D. (detachment of retina in 11 cases)	6	1	35	30	19	84	13.93
Squint, one eye amblyopic	..	55	..	..	..		
Tobacco amblyopia (not counted in total)	..	..	7	..	..		
Total						603	100.00

without iritis, and due to congenital syphilis, heads the list, accounting for 28 cases in 72.

Senile Cataract.—Senile cataract accounted for more blindness in this collection than any other disease. No doubt many of the cases would be susceptible of amelioration if and when operation could be performed, but at the time they were industrially blind. The seventeen blind in both eyes include several who had been operated upon successfully by myself or other surgeons, but who were found after operation to suffer from central senile choroiditis; operation secured for them some freedom of movement, but owing to degeneration of the retina they could not see definite objects or read. These cases are very disappointing to the surgeon and to the patient, and perhaps do more to discredit operation in the popular mind than the less frequent cases of operative failure or postoperative inflammation. Unfortunately the condition cannot be foreseen.

Iritis and Iridocyclitis.—Of known causes of iritis syphilis heads the list. Syphilitic iritis produced total blindness nearly as frequently as all the other causes together. Cases classed "various" include a great variety of approximate causes, such as those arising from septic states within the body, tubercle, gonorrhea, rheumatism, gout, pyorrhea, colon disease, and bladder infection in nearly equal proportions. There were several in which no case could be assigned with any certainty.

Vascular Diseases.—Blindness due to vascular diseases, such as kidney disease and diabetes, was not frequent when the incidence of these general diseases is considered.

One of the cases in this group illustrates the danger of the "one eyed" man. A man with one eye practically blind from old squint lost the other completely by embolism of the central retinal artery. (Two other cases of one eyed men in the return lost the remaining eye, one by accident, the other by disease.)

Detachment of the Retina.—In this group are 25 cases, of which 14 were blind.

The causes of the detachment were many. Ten occurred in subjects of myopia of less than 10 D.; other cases were due to the effects of antecedent inflammation of the eye causing vitreous changes; some to alleged but unproven injury or septic disease; and in some no cause could be found. Besides these there were 11 other cases of detachment in the myope group and one double detachment due to accident. So that there were in all 37 cases of detachment.

Choroiditis.—The frequency of senile decay of the retina and choroid at the macula was remarkable. There were 45 of these cases in a total of 109. The condition is irremediable, and probably unpreventable, but the subjects of it are not so hopeless as those blind from other causes, for they can move about by sight with comparative freedom, even tho the sight of definite objects and of reading is lost to them. I had one patient, a parson, who did his full duty; his parishioners did not know of his blindness, a good memory enabled him to "read" lessons and prayers, whilst his keen observation enabled him to recognize his parishoners by gait or tricks of manner.

Optic Atrophy.—Syphilis headed the list of primary causes of optic atrophy, being responsible for nearly one-half of the cases, including 6 cases of simple atrophy and 11 of tabes dorsalis.

Glaucoma.—It is noteworthy how much more common was the chronic form of glaucoma than the acute, and how much more dangerous were its effects. Even after successful operation gradual decline of vision was common.

Malignant Disease.—Malignant disease was a rare cause of blindness. Of the two totally blind, one was a child with double glioma of the retina, the other a man with sarcoma in one eye; his other eye had been lost earlier by embolism of the retinal artery.

Myopia.—In this group only those with myopia of 10 diopters or more were included. They numbered 99. Of these,

8 had good vision, 6 defect of one eye, and one blind of one eye: 84 had more or less bad vision, and were blind for industrial purposes. High myopia, therefore, comes second on the list as a cause of blindness, after senile cataract, and unlike the latter its effects are irremediable. The causes of the failure of vision were mainly three: vitreous degeneration and opacities, detachment of the retina, and choroidal degeneration. Of the three, the last was the most frequent. The changes seen were patches of gross degeneration, or much more frequently finer degenerative changes more nearly like a coarse form of central senile choroiditis. Not infrequently the final loss of central vision was due to a hemorrhage into the threadbare tissue of the macula. These figures of the high incidence of blindness amongst high myopes form a strong plea for the increase of preventive educational methods, such as the myope class amongst children, so that they may learn to use their eyes with discretion; and also for care in the selection of suitable work for them when they leave school; too many of these persons with high degrees of myopia and blindness had been occupied in clerking.

Squint.—The risk of the "one eyed" has been commented upon. The loss of central vision from squint can be prevented in many cases if they are treated early. There is still a belief abroad that children "grow out of squint," but they do so with the loss of an eye. They become ineligible for the services, for many forms of industrial employment, and there is an added risk from accident.

Tobacco Amblyopia.—The number of cases of chronic poisoning and loss of vision from the excessive use of tobacco was small. The disease is remediable; those seen were referred by doctors, and since they were not seen a second time it is assumed that they were cured by treatment.

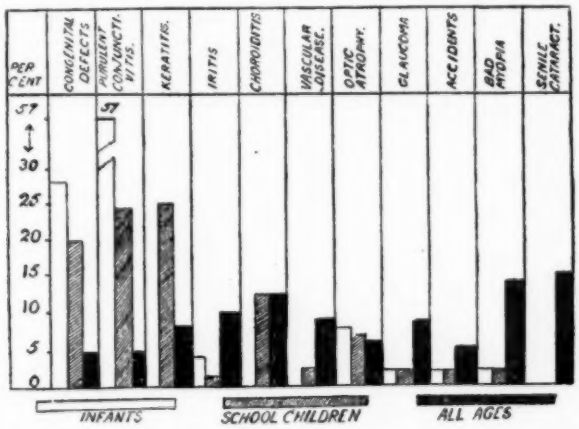

Chart showing frequency of different classes of the conditions, as causing blindness.

The Incidence of Venereal Disease.—Cases of ophthalmia neonatorum numbered 17; assuming these severe cases to have been gonorrheal, they make with the one case of gonorrheal conjunctivitis in an adult 18, or 1.95 per cent. of the gross total of 925; including the 5 cases of gonorrheal iritis the total percentage equals 2.48.

Cases of disease due to syphilis—keratitis, irido-cyclitis, choroiditis, optic atrophy, and tabes—numbered 85, or 9.19 per cent. of the gross total. These syphilitic cases form the largest group of preventable disease in this all-age selection of blind persons.

CAUSES AND PREVENTION

1. The difference in the incidence of the various causes of blindness in these three sets of cases under examination

is clearly shown in the chart. (*a*) In infancy the causes of blindness are few, so the percentage of these causes is high. Congenital defects and purulent conjunctivitis account for nearly all, other causes are few and the number of cases insignificant. (*b*) Amongst school children other conditions come into account. First, the death rate of infancy will have reduced the number of cases of blindness in infants. Secondly, other causes of blindness will show their effects, particularly those arising from constitutional disorders. So that the startling high percentage due to ophthalmia neonatorum is reduced, and takes second place to the larger number of blind cases due to congenital syphilis. (*c*) In the third group of persons of all ages, infants, children and adults, there are again two facts that modify the conditions found for infants alone, or children alone. The age proportion of the population comes into full play, the greater number of adults reduces the infant population to its correct position, and correspondingly the incidence of the several causes of blindness. But other causes of blindness which affect mainly or only adults—accidents, vascular disease, glaucoma, gross myopia and senile cataract—swell the total blindness and correspondingly diminish the proportion of blindness of infancy or childhood.

I suggest that the return of the third set of evidence presented, from all ages, gives a fair picture of the causes of blindness occurring in the population of this country generally. Minor differences may appear in different areas due to special industrial conditions, but these will hardly be likely to affect the main proportions.

2. Examination of popular literature indicates that wholly erroneous beliefs are held as to the causes of blindness owing to the laxity with which statistics are quoted. Looking at these returns one would be justified in stating that 50 per cent. of the blindness of *infancy* is due to the preventable disease ophthalmia neonatorum, but wholly wrong in stating that 50 per cent. of blindness was due to this cause. Again, it would be correct to state that 50 per cent. of the blindness in *school children* is due to parental venereal disease, but not that 50 per cent. of blindness is due to venereal disease; yet I have seen this statement in print, based on an incorrect quotation of my 1913 returns. The true figures for "all ages" are seen to be blindness from gonorrheal disease 2.5 per cent., from syphilis, 9 per cent.

3. Prevention. If we examine the table of the causes of blindness we shall see that there are certain causes over which we can have little influence, and others which are well within our power of prevention, possibly of extinction.

(*a*) *Congenital Defects.*—Too little is known of the primary causes of sporadic cases to permit of useful suggestion. A small number are hereditary; where the defect is serious marriage and parenthood is undesirable.

(*b*) *Ophthalmia Neonatorum.*—Prevention of the disease can be secured by the treatment of the vaginal disease of the expectant mother; this is the one and only certain means of prevention. And it is within our power to accomplish this desirable end. Measures to check the effect of the infection in infants have reached a high measure of success. Prophylaxis and notification have done much to this end. Short of a stiffening up of the procedure in certain districts of the country these measures have accomplished all that they can. What is now needed is the establishment of such medical arrangements that diagnosis and treatment can be made as swiftly as the fire brigade can be brought in when there is an outbreak of fire in our homes. I would like to see established in the center of every convenient area an ophthalmia neonatorum unit. There should be a small hospital to which affected mothers and infants could be transferred for treatment. To this there should be attached a mobile diagnostic unit. A motor car fitted with a small laboratory equipment with an expert ophthalmic surgeon and nurse; the unit should be available for immediate attendance at any home where a suspected case occurs. Midwife or doctor in attendance should notify the initial

symptoms of any case, so that the mobile unit could proceed to its investigation without delay. If the surgeon should find the diagnosis proven it should be within his power to remove the mother and infant to the hospital for treatment forthwith. The benefits of prompt removal of affected cases have been demonstrated in Liverpool. A similar hospital has been established in London, but its benefits have been almost nullified owing to the lateness of the transfer of cases. I believe doctors would welcome the possibilities of prompt assistance in diagnosis, for cases are not numerous, and accurate diagnosis is only possible where there is constant handling of these cases. The costs would be little compared with the benefits in the reduction of blindness.

(*c*) *Purulent Conjunctivitis in Later Years.*—The number of cases is so small and the variety of primary causes so large it would appear that we have here something like an irreducible minimum. It is remarkable that trachoma is almost negligible as a cause of blindness in this country.

(*d*) *Phlyctenular Keratitis.*—The number of bad cases arising therefrom is small, but the number of damaged eyes is large. These cases are most certainly preventable. They are primary, due to social conditions—poverty, poor food, dirt. They are scarcely known amongst well-cared-for children. Treatment of relapsing cases cannot be effectively carried out unless there is a long period of efficient treatment in a high and dry country district. Recently arrangements have been made in London for the removal of cases occurring in school children to the Swanley Ophthalmia Schools in Kent, and we may expect good results from these measures.

(*e*) *Syphilis* is one of the great causes of blindness. It is certainly preventable. It rests with the success of the centers for the treatment of venereal diseases. If parents were effectively treated before procreation, cases of blind children from this cause would be extinct. There is no reason why we should not attain this success.

(*f*) *Industrial Accidents.*—Blindness from this cause is likely to show variation in different parts of the country. It will be high in industrial areas. Prevention is to be obtained by the better safeguarding of machinery and the use of goggles in all work where flying fragments are common. There is at present a prejudice amongst workers against goggles. A large part of this is, I believe, due to the atrociously bad fit of the common run of these protectors. Difficulties from sweat and steam there will be always, but if to these be added a fit so uncomfortable that the face is hurt and vision obscured it is no wonder that goggles are objected to. Well fitting goggles suited to the particular industry, and the extension of the propaganda of the "Safety First" Association, will go far to popularize their use and reduce accidents. Introduction of a bonus scheme into workshops whereby workers gained by the reduction of accidents would go far to stimulate healthy views on the desirability of workers protecting themselves. In some work, such as in coal mines, where accidents are common and sepsis therefrom dangerous, protectors are impossible of use; in such cases first aid stations, where foreign bodies can be promptly removed and risks of infection averted by irrigation, are needed urgently.

(*g*) *Myopia.*—This is no place to discuss rival theories of the causes of myopia. Purely by way of convenience we are accustomed to speak of two divisions—a "school" or "acquired" myopia, and a "congenital" or "pernicious" myopia. School myopia is of low degree and does not figure in this return. This low degree myopia is probably due to many causes acting, singly, consecutively, or conjointly in this or that case. A hereditary softness of the coat of the eye, softness of the body due to illness, difficulty in seeing owing to astigmatism, habitual close work under bad conditions of light, position, and health, are each and all undoubtedly causes severally or jointly in the production of myopia of low degree. Of all of these the last, the conditions of

work (duration of close work, lighting at work, position at work, and the state of health whilst at work, for child and adult) is the one factor that is in our power to influence. For that reason it is wise to concentrate on the possible. But the cases of myopia in the return of this paper are not these. The children of the myope classes are high myopes, and some are found at such an early age that environment cannot be responsible for their onset. The figures show that the maximum incidence ranges between 10 and 15 diopters of myopia—a very high figure. It is obvious to the least observant that even when provided with suitable glasses these children see with difficulty both distant and near objects. Further, there is evidence that these stretched eyeballs are frail, and that there is an ever present risk of damage or degeneration of the retina, and that this risk is increased by strain. The myope classes are established to meet these two difficulties. To provide these handicapped children with a scheme of education which can be undertaken with least strain to the eyes, and to teach them such methods of work as may, by becoming habitual, even after school years, help to prevent the dangers that threaten. This influence is made conspicuous when the child leaves school by assisting arrangements for obtaining suitable work, a matter of especial moment when we note how high a proportion of adults with high myopia and retinal degeneration have been employed as clerks. The scheme of the myope class is very simple. It is a reversion to the times when the teacher was supreme in the class and not books and paper.[2] There are thirty-three of these classes in London; classes have been established in Bolton, Birmingham, Bradford, Leicester, Leeds, Liverpool, Stoke-on-Trent, Nottingham, Exeter, Brighton, Bristol, Sheffield, Walthamstow, in some towns of Scotland, in several of the United States of America, and a special committee has reported in favour of establishing them in Canada. There is room for the establishment of more of these classes particularly in urban areas; it would be a genuine measure for the prevention of blindness.

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NEIGHBORHOOD SIGNS IN PITUITARY TUMOR

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OMAHA, NEBRASKA

The symptoms of pituitary tumor due to the proximity or extension of the tumor are largely ocular. They are here summarized in a way serviceable to the ophthalmologist, who may be first consulted for such disease. Read at the meeting of the Sioux Valley Eye and Ear Academy, July 12, 1921.

This subject should be of special interest to ophthalmologists and rhinologists, as the greater number of early diagnostic signs of pituitary tumor relate to the eye and the nose. The term, neighborhood sign, is used to indicate a disturbance of function of neighboring structures by enlargement of the pituitary gland from tumor growth.

The pituitary gland is situated in a small fossa of the sphenoid bone, the sella turcica or pituitary fossa, bounded inferiorly by the sphenoid cells, anteriorly, and partly above by the anterior and the posterior clinoid processes of the sphenoid bone, laterally by the cavernous sinus, and above by the dorsum sellae and the diaphragma sellae, a membrane of dura which is perforated by the stalk of the infundibulum. Above this dural membrane is the optic chiasm and the floor of the third ventricle of the brain. This close relation to the sphenoid cells below and the optic chiasm above, leads to the neighborhood signs related to these structures and to the question of operative approach to pituitary lesions.

The pituitary gland is surrounded, in addition to its bony encasement, by a dural envelop which bridges over the lateral and superior bony deficiencies. Tumor growth of the gland would first produce symptoms of tension within the dural capsule. The tension of the dura causes headache, localized fairly accurately in the sphenoid region and radiating to the temples. This headache is subject to variation, probably due to differences in vascular distention of the enlarging gland, but often is severe and persistent. The differentiation from sphenoid cell infection is not easy in the early stages before bony or other neighborhood symptoms appear.

The next neighborhood symptom in many cases is enlargement of the bony fossa of the pituitary gland, revealed by X-ray. The necessity for stereoscopic X-ray plates should be emphasized, with the view slightly down into the fossa, thus enabling one to estimate an increase of depth where the lateral borders might be normal in appearance and hence misleading. The average normal measurements of the sella are 10 to 12 millimeters anteroposteriorly, 8 millimeters in depth and 14 to 15 millimeters transversely. Profile radiographic measurements exceeding 15 millimeters anteroposteriorly and 10 millimeters in depth may be looked upon as indicating an enlargement, not necessarily pathologic. However, the extreme of normal variation may reach 30 millimeters anteroposteriorly.[1]

The pathologic changes in the pituitary gland which produce enlargement are chiefly adenomatous and cystic, not truly malignant, and are commonly associated with the familiar syndrome of hypopituitarism from deficiency of pituitary secretion. Giantism and acromegaly usually are uncomplicated by tumor formation. Heuer[2] recently reported on the pathology of twenty true pituitary lesions in which operation was performed, and solid adenomata found in 80%, and cystic adenomata in 20%. There was greater variety in the suprasellar tumors; gliomas, solid and cystic epithelial tumors, and sarcoma; none of these, in a strict sense, having origin from the pituitary gland. The bony changes due to true pituitary tumor vary from a simple spherical distension to an extreme balooning out of the fossa, which projects far into the sphenoidal cells and destroys more or less completely the dorsum sellae.

The direction of early extension of pituitary tumors is of great importance from the viewpoint of surgical therapy. This has been discussed recently by

Heuer[2] of Johns Hopkins and by Adson[3] of the Mayo Clinic. Heuer, from his personal experience in viewing pituitary tumors thru an intracranial approach, believes; first, that before the floor of the sella turcica has been eroded and even before the posterior clinoid processes have become destroyed, the pituitary tumor has broken thru the diaphragm of the sella turcica and become an intracranial growth; and second, that even tho the floor of the sella turcica is removed by early operation conducted thru the nose, the tumor will not, or only to a slight extent, grow downward, but will in spite of these measures grow upward into the intracranial chamber. Examination of the reports in the literature of cases, in which the patients died after transsphenoidal operation, showed that in practically 100% of the cases, even tho the floor of the sella turcica had been eroded and the tumor filled the sphenoidal cavity, a far larger portion of the tumor had extended into the intracranial chamber. Adson in a report of six cases, approached intracranially, found a similar early intracranial extension.

This fairly well establishes early intracranial extension of pituitary tumors and leads to the visual neighborhood symptoms which are dependent upon pressure of the tumor on the under surface of the optic chiasm. The direction of growth after pituitary tumors have broken thru the diaphragm sellae may be in any one of five positions; first directly upwards against the chiasm; second, forward in front of the optic chiasm between the optic nerves; third, backward behind the chiasm; towards the third ventricle of the brain; and finally the tumor may grow laterally on either side of the chiasm and involve the cavernous sinus. Cope[4], on anatomic grounds and from a study of the literature, concludes that the early intracranial extension of pituitary tumors is forward in front of the chiasm. Heuer, in 22 intracranial exposures of pituitary tumor, found the extension forward between the optic nerves in 20 instances. Adson's six cases, exposed intracranially, all appeared forward.

The visual symptoms produced by this rather constant forward intracranial extension of pituitary tumors are perhaps the most important of all neighborhood signs. In the first place, their presence establishes the fact of intracranial extension sufficient to cause destructive pressure on the optic nerves. The result of this is a simple optic atrophy without the presence of choked disc. The second point of importance is the necessity of operative relief before this optic atrophy has progressed to an irreparable stage.

An analysis of the position of the several fasciculi in the chiasm and optic nerves, based upon Henschen's[5] and Cushing's[6] works, explains readily the fact of the more frequent association of bitemporal hemianopsia with pituitary tumors. Pituitary tumor in its typical anterior extension would first press on the under surface of the chiasm and interfere with the ventral, crossed fasciculus which supplies the lower nasal retina, thus producing a visual field defect in both upper temporal quadrants. Further anterior extension of the tumor between the optic nerves would result in medial pressure on both ventral and dorsal, crossed fasciculi and a more complete temporal hemianopsia. Cushing has divided the progressive visual field defect of pituitary tumors into eight stages from upper temporal quadrant defect to complete blindness. It is noteworthy that the color fields show an earlier defect than the form fields, a point which is of early diagnostic significance.

In a large series of pituitary tumors there always are found numerous variations from the typical bitemporal hemianopsia, due to the variability of the direction of growth and the late stage commonly encountered at first examination. These atypical visual field defects more often are due to suprasellar tumors, not of the pituitary gland proper. Thus, in Heuer's series of 25 exposed tumors producing a chiasmal lesion, 73% were pituitary tumors, 24.3% were suprasellar tumors,

and 2.7% optic nerve tumors, which probably represents a truer average than previous records.

There are many other neighborhood symptoms that occur in advanced cases of pituitary tumor with extensive intracranial infiltration. Involvement of the oculomotor nerves may cause paralyses; involvement of the cavernous sinus is thought to account for a moderate exophthalmos in some cases. The olfactory tracts may be destroyed and anosmia result. Pressure on the uncinate region of the temporal lobe of the brain may cause epileptiform seizures with a gustatory or olfactory aura. Nasopharyngeal signs are common, troublesome epistaxis; intermittent discharge of mucus, and hypertrophy of lymphoid tissue. These often have led to ineffective nasal surgery without recognition of the underlying cause.

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TRANSPLANTATION OF OCULAR MUSCLES

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This report of personal experiences covers cases of abducens paralysis, paralysis of the superior rectus and ptosis treated by transplantation operations, using the technic worked out by the writer. This technic and the results obtained are explained by illustrations. Read before the Colorado Congress of Ophthalmology and Oto-Laryngology, July, 1921.

The surgeon and internist should be interested in this subject because paralysis of ocular muscles is usually a symptom of some disease or head injury, and is first seen by one or the other. It should interest the otologist because abducens palsy occasionally occurs in disease about the apex of the petrous portion of the temporal bone (Gradenigo Syndrome). They should be informed that relief is possible in spite of the statements to the contrary in most textbooks of ophthalmology. Cases of paralysis of ocular muscles should not be dismissed as incurable and told to wear a patch, but should be referred to the ophthalmologist early, in order that the progress may be watched and operation done as soon as it is certain that power is not returning in the affected muscle. Cases of third nerve palsy must be excluded as a complete case of this kind leaves nothing with which to work.

Operation should be done before contracture starts in the opponent of the affected muscle, because it may then be possible to avoid extensive tenotomies and so obtain a better final functional and cosmetic result. Usually a paralysis shows early improvement and a fairly rapid progress toward its final position. If it is complete at the end of three months in spite of proper treatment, the prospect of cure is too slight to warrant further delay. In cases of incomplete paralysis, operation should be delayed till it is certain that progress toward cure has stopped. In these cases better average functional and cosmetic results would be obtained by transplantation, omitting tenotomies, than by the usual shortening of the affected muscle with tenotomy of the opponent. In cases of congenital paralysis, or absence of the externus, contraction of the internus seldom occurs so that there is no great hurry on that account. However, these cases should be operated as early as possible in order to increase the chance of saving vision.

The fact that binocular vision has been secured in a number of the reported cases seems to show that the muscle action is guided entirely by the fusion sense, irrespective of the muscle or nerve employed to secure the necessary movement. If this is true the transplantation principle can be applied in the following classes of paralyses:

1. Of the externus which, of course, is the commonest as well as the most favorable. Here the outer halves of the vertical recti are to be used.

2. Of the internus of which the commonest is that due to excessive tenotomy for convergent squint. However, isolated paralysis of the internus does occasionally occur as a partial third nerve palsy, or as a complication of ethmoidal suppuration. In this instance the inner halves of the vertical recti are used; and the operation should be more successful because the tension on transplanted sutures would not be so great. In fact, owing to the angle of the vertical recti, the distance to the internus margin should actually be less than to their own normal attachment.

3. Of the superior rectus, which is not uncommon as a congenital condition. It is occasionally traumatic, as in my case. Here the upper halves of the horizontal recti are used. Transplantation of the middle section of the levator palpebrae is possible (a Motais in reverse). One such case has recently been reported.

4. Of the inferior rectus in which the lower halves of the horizontal recti should be used. I have never seen a case of complete isolated paralysis of this muscle.

5. Of the superior oblique for which the only available method is that advocated by Jackson of moving the superior rectus outward. The only cases of this condition I have seen have been successful in escaping operation at my hands.

6. Of the levator palpebrae (also congenital absence thereof) for which the central portion of the superior rectus is used; the Motais operation.

the three muscles. This is virtually what was done in case 8 with such excellent results.

PERSONAL CASES

1. *Abducens Palsy,*—Seven cases, complete 4; incomplete 3. Results: In one incomplete case there was an entire failure to change the condition and in one complete case no outward rotation was obtained, but only a cosmetic result. In

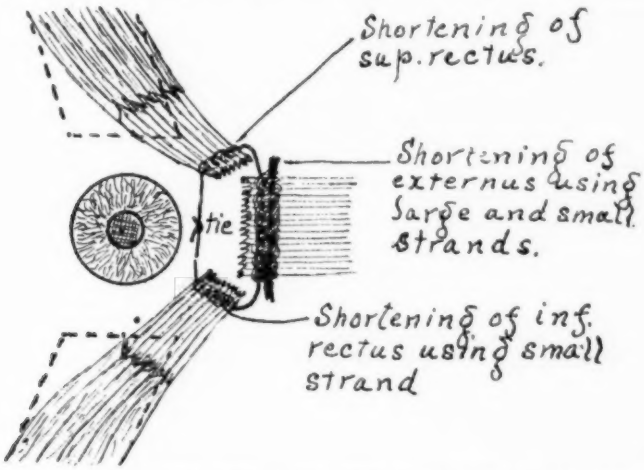
Shortening of sup. rectus.
Shortening of externus using large and small strands.
tie
Shortening of inf. rectus using small strand

Fig. 1.—Continuous cinch shortening of three tendons with transplantation.

TECHNIC. Under case 1 is given in detail the method of operation as modified by me, and under the other cases the various changes in this as thought best in each instance. Here I wish again to emphasize the need to shave the tendon close to the sclera to save the fibrous attachment and to lessen the chance of the stitches slipping out. Still further to lessen the chance of that accident I now use my cinch shortening loop in the portion transplanted. This method was described in detail in a paper for the 1916 meeting of the Section on Ophthalmology of the A. M. A. (See Transactions, p. 241.) This is used also in the Motais operation and is my only modification of that operation as usually described. Figure 1 shows the cinch shortening method as I am going to try it in my next case. Thus modified it seems much simpler to me, and consists in using a continuous cinch shortener for all the others satisfactory results as regards position and rotation were secured.

2. *Superior rectus palsy,*—One in which the result was excellent both as to position of globe and rotation.

3. *Ptosis,*—Six in which the Motais operation in each instance was successful in uncovering the pupil even in extreme upward rotation. Remarks on this operation and the series of six cases are grouped separately.

These results make it entirely worth while to try transplantation, as the cases are otherwise hopeless and in any event cannot be made much worse.

CASE I. This case has been reported with explanatory illustrations in this JOURNAL. (Mar. 1919, v. 3, p. 197.)

CASE 2. O. B. Complete paralysis of the left externus due to skull fracture. Outward rotation stops 10 degrees short of primary position; convergent squint of 30 degrees. Operation Feb. 17, 1917, by the same method as in case

1 but under a local anesthetic. An extremely unruly patient making the proper carrying out of the steps very unsatisfactory. Internus not touched. One week later esophoria 12° and maintained binocular vision in primary position; beginning outward rotation (5 degrees). Feb. 27th a central tenotomy of the internus was done, this with the idea of playing safe as the vision was normal in each eye. One week later he had esophoria 2° and outward rotation of 16° with no diplopia in primary position. On this date I proposed an actual lengthening of the internus which would certainly have given a worth while increase in outward rotation. But he disappeared and I have not seen or heard from him.

CASE 3. J. H. F., 50 years. Another complete case. Thinks he was always slightly cross-eyed, but about five years ago began to grow rapidly worse. Now right eye converges 60° and is unable to turn out to the primary position. Outward rotation in the other eye also weak (about 30°). Operation Dec. 5, 1918, by the same method as case 1 except that the internus was completely cut. The immediate result was a reduction of the squint to 20 degrees and an outward rotation to 20 degrees. On Dec. 23rd, his squint measured 15 and outward rotation 30. On this date, because of weak externus of other eye, I proposed shortening it, but he promptly disappeared.

CASE 4. W. H. B. 20 years. Right eye crossed since 3rd year. Outward rotation stops well short of primary position making it a complete case. Operation July 19, 1919, the same as case 1 but with an extra large shortening of the middle section. Internus not touched. July 31st, eyes were parallel in primary position, but with only a suggestion of outward rotation. In hopes of increasing this the following operations were done. Aug. 2nd. Internus lengthened to limit. Aug. 18th. Inner halves of vertical recti cut. Aug. 29th. Complete tenotomy of internus. In spite of all these there was no gain in outward rotation. Jan. 27, 1921. Right eye converges about 10 degrees; able to turn eye only to primary position. He is fairly well satisfied with the cosmetic result. The probable cause of failure to secure rotational results was too great relaxation of transplants, by the large shortening of the externus, with a consequent return to their original position.

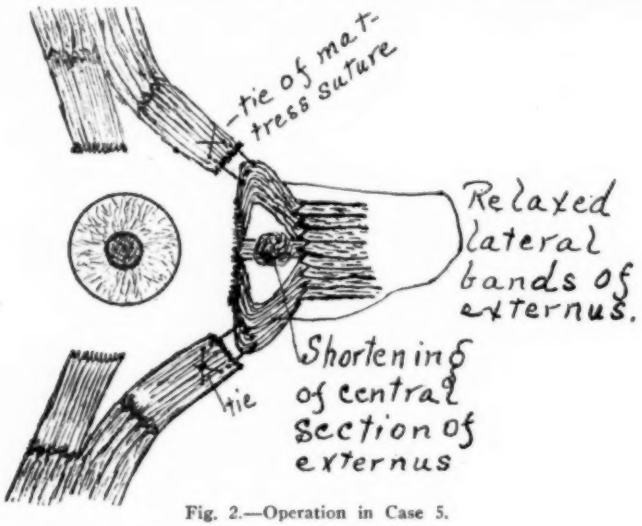

Fig. 2.—Operation in Case 5.

CASE 5. C. R. L. 35 years. Left eye converges 60 degrees; internus contracted; outward rotation only 20 degrees. This is therefore not a complete case. Internus had been cut when he

was 19. Operation June 5, 1919, by method shown in Fig. 2. The middle band was given a large shortening thus relaxing the lateral bands so that the vertical recti transplants could be sutured directly to them without tension. Internus was dissected free but steadied by a mattress suture. Aug. 5th, had an outward rotation of 40 and a remaining squint of 20 and on this date the internus was again dissected free.

Case 7. Specific paralysis of left externus, of one year's duration. There was no squint, in fact inward rotation was defective indicating partial paralysis of the 3rd nerve as the vertical rotations were normal.

Operation No. 4, 1920. Method was varied as shown in Fig. 3. The entire externus was shortened; and the transplants merely slung together by the same stitch, so in case one stitch slipped both transplants would go back to their normal positions. This was done because she had normal vision in each eye; binocular vision; and therefore I did not wish to risk producing a vertical deviation. The stitch must have pulled out for the result was a total failure to make any change in her condition. She was an impossible patient during the operation and has caused me to favor general anesthesia for all these operations, unless there is a positive contraindication.

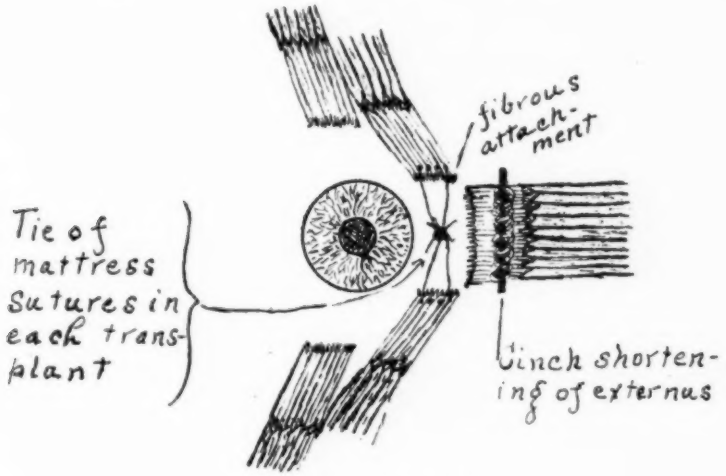

Fig. 3.—Operation in Case 7.

Sept. 17th, the pupillary membrane (remains of a traumatic cataract present since first year) was cut by a scissors operation.

Dec. 12, 1919. Now has a black pupil and a temporal visual field for hand movements but no direct fixation or vision. Eyes are perfectly parallel and outward rotation is 50 degrees. It is possible that just as good a result would have been secured by a simple shortening of the externus with complete tenotomy of the internus.

Case 6. F. F. Specific paresis of right externus, outward rotation 5° with a convergent squint of 30°. Aug. 18, 1919, operation as in Case 1, the internus not being touched. On Sept. 3rd, his eyes were parallel and outward rotation had already increased to 20°. This man was a sailor and on this date his ship left, so I have not seen him since.

Case 8. Mrs. N. B. Complete paralysis of left *superior rectus*: almost complete of lid elevator with absolute blindness all due to gunshot wound of orbit. Motion of eye right, left and down is good. Eye itself turns far down. There is but little upward motion of lid, being slightly better on awaking. Operation May 22, 1920, consisted in transplantation of upper halves of hor-

izontal recti to margins of the superior rectus by method shown in Fig. 4, with a complete tenotomy of the inferior rectus. Immediate effect was a slight upward deviation of globe and a marked improvement in the ptosis. June 15th, she was able to rotate the eye up 20° and there was a slight upward deviation as shown by the pupillary reflection of light. The idea in this case was to obtain some upward rotation I wish to emphasize that this operation gives the closest possible approach to the normal associated action of the superior rectus and lid elevator.

The technic is covered so fully in Beard's Ophthalmic Surgery (p. 247-250) that it would be a waste of time for me to repeat it. In his summary, he mentions having done the operation 16 times and states: "The results in all of them are far and away the best I

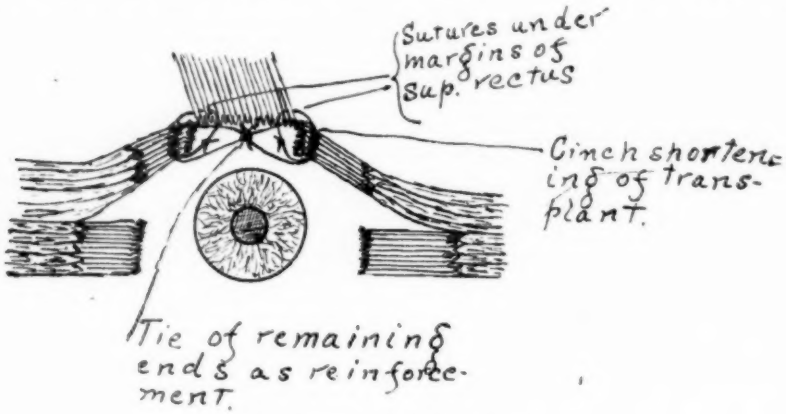

Fig. 4.—Operation in Case 8.

tion of the globe and then do a Motais operation. I have not seen her since June 15, 1920; but in a letter, dated April 21, 1921, she says "I would like to have you see the eye now. The lid is up quite a bit and the eyeball is way up."

The variation in method in this case consisted in shortening each transplant by my cinch loop using double triple O gut, one end from each going under respective margin of superior rectus and tied, the remaining two ends from each transplant being tied together in front of superior rectus insertion as a reinforcement.

MOTAIS OPERATION FOR PTOSIS

In my opinion this should always be the operation of choice where any power of upward rotation (no matter how small) of the globe is retained. Case 1 proves this.

There is no need before this meeting to go into detail as regards the technic of the operation In this connection I wish to emphasize that this operation gives the closest possible approach to the normal associated action of the superior rectus and lid elevator.

The technic is covered so fully in Beard's Ophthalmic Surgery (p. 247-250) that it would be a waste of time for me to repeat it. In his summary, he mentions having done the operation 16 times and states: "The results in all of them are far and away the best I have ever obtained in this affection. The manner in which the free border of the lid keeps out of the way of the pupil, as the subject looks further upward is truly beautiful to contemplate." Further he says: "No matter how little there is (of upward rotation) the Motais operation is the one, in my opinion, that should be chosen. After the lid is once raised the superior rectus develops more and more its proper function. Herein lies the explanation of a unique and most gratifying feature of the Motais method, viz., the constantly increasing enhancement of the effect for weeks and even months after the operation."

These quotations leave little to be said except to report the results in my six operations.

Case 1.—Miss M. B., age 25, presented a complete ptosis of left lid the result of falling on a button hook in her third year. There was also a downward displacement of the globe. Upward rotation only 20° as compared

with 40° in the other eye. With the idea of increasing upward rotation, preparatory to Motais, two preliminary operations were done; a shortening of the superior rectus and a lengthening of the inferior rectus. After these, vertical rotations were practiced for three months by which time the upward rotation had reached 35°. The Motais was done on May 20, 1919, without much trouble. The result was excellent the pupil being uncovered even in extreme upward rotation. The brow, which was very high, gradually

Fig. 5.—Case 2 before operation (Motais).

came down, finally nearly to the same level as the other. This case had had two operations which must have been merely skin exsections so that the lid hung from the brow like a curtain.

CASE 2.—J. J. 6 years. Congenital ptosis of left lid. Upward rotation of globe normal. There is also a convergent squint. Did Motais operation on Dec. 8, 1919 without trouble. Healing uneventful. One year later the excellent result was maintained, the pupil remaining uncovered even in far upward rotation. In the primary position the lid aperture is only one half millimeter less than that of the good eye. The convergent squint has practically disappeared. Figs. 5 and 6.

Fig. 6.—Case 2 after operation.

CASE 3.—Mrs. H. S., music teacher who desired the operation for cosmetic effect. The drooping of right lid had been gradually increasing for 15 years and now the aperture is only one-half that of the other side, even less tired locally or generally. Motais operation

Fig. 7.—Case 4. The contrast in the two eyes shows the appearance before and after operation.

Fig. 8.—Case 5. The contrast in the two eyes again shows the before and after operation appearance.

performed Feb. 2, 1920, without trouble and with uneventful healing. On June 2, 1920, the palpebral aperture was 9.5 as compared with 10 millimeters on the good side — 9 in extreme upward rotation.

CASE 4. —A. P., aged 6 years. A case of bilateral hereditary ptosis with reversed epicanthus (lower lid overlaps upper) and convergent squint. The case is similar to case 5 only the deformity was much worse. The Motais operation was done on Sept. 2, 1920,

Fig. 9.—Case 6 before operation.

without trouble and healing was uneventful. The usual effect was secured, namely an uncovered pupil even in upward rotation, while before operation she had to throw the head far back in order to see under the lid margin. Fig. 7.

CASE 5. —F. R. aged 4, similar to 4 only not so bad and not hereditary. This case had had an operation on each lid by another ophthalmologist and also one on the nasal bridge for the epicanthal deformity. All were failures

Fig. 10.—Case 6 after Motais operation and shortening of internus.

according to the mother's statement. I think no attempt should be made to correct the epicanthus till maturity as the growth of the nasal bridge lessens it. This deformity in the father of case 4 was hardly noticeable.

Upward rotation of globes normal. Motais operation Nov. 12, 1920. This case must have had the cornea injured during the operation as he developed a large ulcer near upper border with hypopion. This, however, cleared up and is hidden by the upper lid. The pupil remains uncovered even in upward rotation, as shown by the pictures. The contrast between the two sides gives the appearance before and after. Fig. 8.

CASE 6.—L. N., age 6 years. In this

case the ptosis was the result of injury when three years of age. At that time she fell on a penholder, which penetrated the orbit between the globe and upper wall. It broke into many pieces, several of which were removed by a general surgeon immediately after the injury. Several weeks later, the proptosis remaining, she was brought to me and a study of the case showed a large fragment in the apex of the orbit. At operation this was found firmly set in the optic foramen and was removed. Of course the eye was permanently blinded.

Motais operation was done on Feb. 24, 1921 without trouble. In this case, instead of pulling the upper lid down to the lower to protect the cornea, I pulled the lower lid up. This I think is the cause of a slight over effect causing about a two millimeter opening during sleep. Outside of this there was no trouble; the aperture is equal to that of the other eye even in upward rotation, while before operation it was three millimeters less. (Fig. 9.) During the three years time the blind eye diverged widely, and to correct this I shortened the internus on April 25, 1921, The result as to the ptosis is shown in Fig. 10.

EXTRACTION OF SENILE CATARACT

CLARENCE A. VEASEY, M.D., F.A.C.S.

SPOKANE, WASHINGTON

Different surgeons secure the best operative results by different methods of operation. But each must use a technic he has carefully worked out and mastered. This paper sets forth that adopted by its writer for cataract extraction. Read before the Pacific Coast Oto-Ophthalmological Society, July, 1921.

When a patient with senile cataract consults an ophthalmic surgeon, he does so as a rule because he desires to obtain the best possible vision. Any procedure, whether hygienic, medicinal or surgical, that will tend toward such a result should be adopted. Any given surgical procedure executed by one surgeon may not produce so satisfactory a result when executed by another surgeon. Circumstances alter cases. One man who has a large number of cataracts to operate upon daily must become much more adept in certain procedures than another who operates for cataract only occasionally. Therefore, as experience widens, the wise surgeon, seeking always the best results for his patients, follows the line of least resistance and adopts such technic as will give his patients the greatest visual acuity. My apology, if any be necessary, for offering briefly the following suggestions is that they have given me the best results for my patients in an experience of thirty years.

If a patient is under observation for some time before the cataract is to be extracted, it is my custom to administer small doses of bichlorid of mercury and iodid of postassium or sodium, one-twenty-fourth grain of the former and five grains of the latter, to be taken in a half glass of water three times daily after meals, and to be used for a month or six weeks prior to the time of operation. In one of my former clinics, we used to distinguish the combination as the one-two-three mixture, meaning bichlorid of mercury grs. i. sodium iodid ʒii, compound syrup sarsaparilla ʒiii, of which one dram was to be taken in a half glass of water three times daily after meals. It was an easy way to designate the formula in the rush of an afternoon's clinic. If a cataract may be due to some extent to malnutrition of the lens, we know that the above is a socalled alterative and the nutrition of the eye is certainly improved. I have observed repeatedly a poor or sluggish light field become greatly benefited after the use of the above, covering a period of a few weeks. The choroid and vitreous are made more healthy, the subsequent vision is better, and, moreover, it is my belief that there is less likely to be an inflammatory process following the subsequent extraction. We give mercury in an accidental injury to assist in preventing inflammation of the iris and ciliary body why not administer it before an intentional injury to assist in preventing a similar inflammation?

For anesthesia, a four per cent solution of cocain hydrochlorat is employed. The solution is freshly prepared and is always made sterile by boiling, and I have never seen any marked loss of anesthetic properties because of such preparation. It is important in my opinion that cumulative instillations be made to produce satisfactory anesthesia. Frequently, not only in the operative work of individual surgeons, but in clinics of large eye and ear infirmaries, I have observed cocain to be instilled prior to operation apparently without any regard to its cumulative effect, and the operators complained that anesthesia of the deeper parts had not been obtained. Many use subconjunctival injections of the anesthetic in order to obtain anesthesia of the iris. For at least a quarter of a century it has been my custom to instill a few drops of the freshly prepared four per cent solution of cocain at three minute intervals for four instillations, and at the end of the

succeeding three minutes, or fifteen minutes from the time of the first instillation, to begin my operation, and in almost all cases, if the anesthetic be employd in this manner, the iris will be found to have been so thoroly anesthetized that there is scarcely any sensation when it is excised.

The question of extracting an immature cataract or to perform some one of the many socalled maturing operations, seems to be a mooted one. It is a question I presume that each operator will settle for himself. The maturing operations in my experience have produced so much sticking of the lens with subsequent difficulty in delivery and loss of vitreous that I much prefer to extract the lens immature than to operate on one that has been artificially matured. In fact, after sixty years of age, I do not hesitate to extract the immature lens after the cataract has progressed sufficiently far to produce loss of useful vision.

Whether to open the capsule for the extraction of the lens or to extract in the capsule is another question concerning which opinion greatly differs. The ideal operation, of course, is that which gives a perfectly clear pupil at once. If the capsule be badly torn in the center, there may result thickened bands difficult to divide with the discission knife. On the other hand, unless one is operating constantly in a clinic furnishing a large number of cataracts, his experience is apt to be such that his technic and his ultimate results will be much better by opening the capsule, and performing subsequent discission if necessary. It is my conclusion that extraction in capsule is not adapted to the American people, nor is it the safest procedure, that is, the one that will produce the best results for the greatest number of patients, in the hands of the average operator in private practice.

It is always my custom when beginning an operation to request the patient to breathe thru the mouth. I am sure that this procedure is an important factor in the prevention of squeezing with the attending loss of vitreous. The patient continues to breathe in this manner until the eye is closed.

The corneal section I employ is the old de Wecker three millimeter flap, the knife being entered exactly at the corneoscleral junction at a point three millimeters below a tangent to the uppermost portion of the cornea, counter puncture being directly opposite, the portion of the cornea involved being divided as evenly as possible and exactly at the limbus. Should the lens be unusually large, the size of the flap is correspondingly increased, even to including the upper half of the cornea.

There is much objection by some to a conjunctival flap; but as I am confident that with such a flap healing is more prompt and the closure of the anterior chamber more rapid, I always endeavor to make one. Some objection is made that more hemorrhage is thereby produced; but the capsule has not been opened and one may take time to stop the bleeding if it interferes with the further steps of the operation, and I am sure in my own experience that the benefits of rapid closure of the wound with a conjunctival flap override the objections urged against it.

It is my custom always to perform an iridectomy. There was so much trouble with prolapse and subsequent inflammation that many years ago I abandoned the extraction without iridectomy. I believe that an iridectomy performed a few weeks prior to the extraction is the safest procedure of all, but as most patients will not submit to the double operation, it is necessary to content myself with the performance at the time of extraction. If I myself, however, had a cataract to be extracted I would request my operator to perform a preliminary iridectomy, and I insist that this be done in every patient having only one eye.

In the extraction of the immature lens or in any extraction where some cortex is left behind, I irrigate the anterior chamber with lukewarm normal saline solution. The nozzle of the irrigator should be placed within the anterior chamber so as to wash the particles from within outward rather

than the reverse. Since seeing Col. Elliot use his irrigator I have employed that apparatus exclusively and find it very satisfactory. It is always employed at the termination of the operation to replace any portion of the iris that may be caught within the lips of the wound, the nozzle of the irrigator in the latter procedure, of course, being outside the anterior chamber and the current directed from without inward.

Both eyes are always dressed. A few layers of dry gauze cut of a size to cover the field, over which soft absorbent cotton similarly cut, usually about three inches in diameter, held in position by a figure of eight bandage, are applied and over this a Ring's ocular mask. The latter I am sure prevents many possible accidents. Sometimes I use bichlorid ointment and sometimes I do not. I confess I have observed very little difference with and without.

The open method of treatment after a cataract extraction I have never tried. I confess that I have been afraid to do so. Even with the best of care accidents will occur, and patients are usually so curious to ascertain whether or not they can see or how much they can see, that I have been afraid to leave the eye exposed. Moreover, in most of our hospitals there are no special wards or rooms for such cases, so they must be protected not only from interference on their own part, but from the light and interference on the part of others.

At the end of an operation and before the patient is removed from the table, he is requested to lie flat of his back if possible for six hours. By the end of this time in the average case the anterior chamber is closed, the lips of the wound being slightly agglutinated. If for any reason the patient must turn, his nurse is instructed to turn him on his unoperated side. The pressure on the operated eye seems less if this is done and there is less chance also for the wound to open; or, in other words, there is greater chance for the wound to become firmly healed. After the first six hours, the patient may be turned on his unoperated side if it has not been done before, and in twenty-four hours he may lie on either side. He is instructed carefully, however, not to attempt to turn himself during the first day.

The first dressing is made at the end of twenty-four hours. Unless there has been pain or is some edema at the angle of the lids, the latter are not opened. The lower lid is slightly everted to allow the escape of any accumulated tears, and a couple of drops of one per cent atropin solution is instilled. The latter is employed to dilate the pupil in order to draw away from the capsule the raw surfaces of the cut iris. Warm compresses are applied for a few moments to both eyes and the face wiped, which is very grateful to the patient, and the dressings reapplied. The dressings are changed daily and at the second dressing the eye is inspected by candle light. If the pupil is not well dilated, atropin is again instilled and repeated often enough thereafter at the time of dressing to keep the edges of the coloboma away from the capsule. On the third day the patient is given a backrest, and on the fourth day is allowed out of bed, the unoperated eye being left undressed, an eye shade being used. Should the patient be very old or in such condition that hypostatic congestion of the lungs is to be feared, the change of position must, of course, be hastened; in some cases I have placed them on a backrest from the time of the operation.

In order to keep the patient as quiet as possible for the first two days, the bowels are thoroly moved by purgation and enema the morning of the day of operation and then a saline administered three-quarters of an hour before breakfast on the third day following the operation, the bowels being kept open subsequently by purgatives or enema to prevent straining at stool. This procedure is conducive to firm closure of the wound. Liquids are given on the first day, soft diet on the

second day, light diet on the third day, and full diet on the fourth day. The giving of full diet immediately after the operation is apt to prevent closure of the wound because of chewing the food. Any time from the seventh to the tenth day, depending upon the amount of reaction and the trustworthiness of the patient, the operated eye is left undressed, the eye shade and dark glasses being worn. Hot saline compresses several times a day and atropin two or three times a day are now employed, if there is much reaction, together with ten per cent dionin solution twice daily, if there be any remaining cortex. Should there be very little reaction and no remaining cortex, nothing but the hot compresses which are very grateful, are employed. The patient is permitted to leave the hospital in two weeks if the reaction is not great, but is kept in for a longer period should occasion demand.

Glasses are not prescribed until one month from the time of the operation. If given earlier, injury may be done to the eye and, moreover, the amount of astigmatism scarcely has become settled even in a month.

It is absolutely essential in order to have a smooth operation and to obtain the best results to have only a competent trained assistant accustomed to work with you. As soon as the corneal section is completed, the assistant elevates the speculum to eliminate all pressure from the eyeball. Should the patient become unruly, the speculum is removed and an elevator substituted. Indeed, the elevator is always employed in cases of high myopia or when fluid vitreous is to be suspected. With trained assistance the operator does not have to remove his eye from the work at hand, the proper instruments being placed in his hands in their required order and those used taken therefrom. Each movement of the eyeball can be watched and the least sign of impending danger observed and possibly eliminated.

In a recent number of the Archives of Ophthalmology Gifford has published a paper on backing out of cataract operations that contains many valuable suggestions. Certainly, occasions sometimes arise when for the best interests of the patient it would be well to discontinue the operation and after a proper lapse of time to reattempt operation, perhaps on somewhat different lines.

Blind patients come to us to have their vision restored. That method of operation and after treatment that has given the best results in the hands of any given operator of experience is the best to be employed by him.

NOTES, CASES AND INSTRUMENTS

MICROPHTHALMIA WITH ENCEPHALOCELE.

HOWELL L. BEGLE, M.D.

DETROIT, MICH.

Microphthalmia is often associated with other malformations, not only of the eyes, but of other parts of the body. In the case reported below, monolateral microphthalmia is associated with

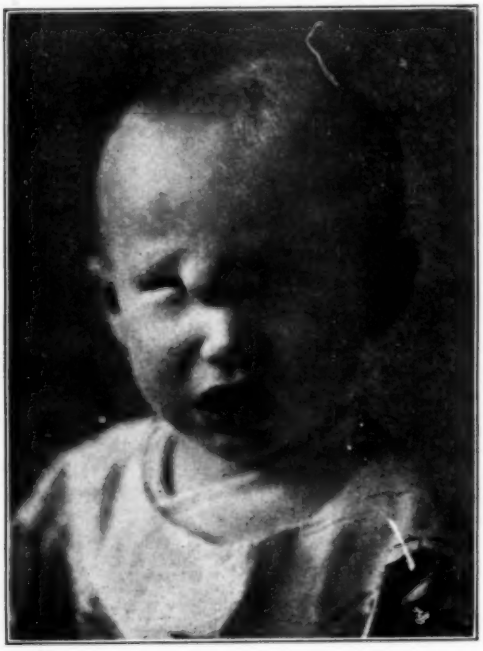

Fig. 1.—Microphthalmia with encephalocele. Begle's case.

an encephalocele, the latter located at the site of its most frequent occurrence, namely, the root of the nose.

T. S., a girl 14 months of age, was admitted to the Children's Free Hospital December 6, 1920.

The father and mother are Polish. While there are four children in the family, this child alone is malformed. The deformity existed at birth, and has undergone no change in appearance. Delivery was normal; forceps were not used. The child has always been well. She is still on the breast and has received no other food than breast milk.

Physical Examination: The child is well nourished and does not appear to be ill. The heart is normal, the lungs clear, and the abdomen, extremities and reflexes are normal. The head is well formed, the sutures closed. The tonsils are enlarged. From the right ear there is a purulent discharge.

The left eye appears normal and vision is apparently not defective. The right palpebral aperture is narrowed and is approximately three-fourths the length of the left. Thru the narrowed lids a glimpse is obtained of a very small cornea, approximately one-third the diameter of the left cornea. When the lids are separated the eyeball, which appears to be approximately the size of a large pea, rotates upward, becomes covered with conjunctival folds and is seen with difficulty. The anterior segment of the globe appears normal.

A rounded tumor, about the size of a half walnut, begins in the median line, slightly above a line joining the two eyebrows and extends downward one and one-eighth inches to the bridge of the nose. One-third of the mass lies to the left of the median line of the face and two-thirds to the right. The tumor is soft, fluctuating and does not appear tender on pressure. There is no visible pulsation. The skin over the mass is of normal appearance and feels free. The tumor appears to rise thru a bone defect, which is located at the normal junction of the frontal and nasal bones, in size corresponding to the end of the little finger. The pedicle of the tumor must be attentuated as the mass can be pushed over to the right, so that the entire bone defect can be felt. Reduction of the mass thru the bone defect cannot be accomplished. When the child cries, corrugations occur in the skin over the tumor and the latter is less prominent.

Stereoscopic plates were made at the hospital and were submitted to Drs. Hickey and Evans for interpretation. They state: "We are inclined to believe that there is an opening in the outer

plate of the skull. The tumor, we think, is connected thru this to the brain."

Under strict asepsis a small needle was introduced into the mass at its apex. Fluid was not aspirated, but for two days a thin clear fluid, resembling cerebro-spinal fluid, appeared in fine droplets at the site of the puncture.

The wound became sealed in three or four days without further leaking or infection.

An operative procedure was under consideration whereby the hernial sac would be tied off and excised and the bone defect closed by a periosteal, or periosteum and bone flap, but as the child developed an acute cold in the hospital, it was allowed to go home and the social service department is now unable to locate the parents.

The occurence of these two malformations together naturally suggest the possibility of a common origin; but without an anatomic examination of the microphthalmic eye and of the hernial tissue, facts are not at hand warranting comment in this direction. Von Hippel[1] and Parsons and Coats[2] have reported cases of microphthalmia with encephalocele of the orbit. In a search of the literature, by no means exhaustive, I have not encountered a case similiar to the one I have here recorded.

MONOCULAR TRACHOMA

HARRY VANDERBILT WÜRDEMANN, M.D.

SEATTLE, WASH.

In the May number, 1896,[3] of the "Annales d'Oculistique," the author published a paper, "La Conjunctivite Granuleuse Monoculaire," reporting three cases of clinically pronounced trachoma limited to one eye, seen during the previous three years. Out of 287 chronic trachoma cases, of which 188 were in the first or granular stage with proliferation of the epithelial elements, 99 were in the third or cicatricial stage. He has not kept track of the number of trachoma cases since that time, but they probably number into the thousands. Since the time of the report, he has seen a number of cases of true monocular trachoma, but they were very few in proportion. During the last year he has had two additional indubitable cases which have had considerable treatment.[4]

The report of the three previously published cases and of the two recent ones are here given, as there is hardly any mention in the voluminous literature of this malady affecting only one eye. There seems to be no reason why it should be confined to one eye. During the course of the disease, the infection is probably first acquired in one eye and then transferred by contact to the other, as the opportunity for this infection occurs hourly during the protracted course of the disease; and hence the disease is usually found both together. The translation of the French text of the three case reports of 1896 is first given.

CASE 1.—R. N. R. Age 23. Irish parentage. Train newsboy. Came first June, 1891. The right eye had been affected for several years. He presented a lymphoid degeneration of the superior cul-de-sac and the tarsal conjunctiva, and had a pseudoptosis. The cornea was affected by pannus crassus. He was anemic, and his work on the railroad exposed him to smoke, dust, and other mechanical irritations. He was given cod liver oil and tonics which ameliorated his general condition. Local treatment was given by nitrat of silver, oxid of mercury, and the copper sulphat pencil. The left eye was absolutely normal with 6/V1 vision. After many months of treatment the case was discharged with a vision of 6/XII in the affected eye.

CASE 2.—A. S. Age 30. Irish origin. Railroad engineer. Seen June 10, 1895. He was anemic and lived under unfavorable hygienic conditions. His right eye had been affected about six months and he had seen a number of

[1]Hippel, E. von. Weitere Beiträge zur Kenntnis seltener Missbildungen. Archiv. für Ophth. LXIII, p. 17.

[2]Parsons and Coats. Pathologic report on a case of orbital encephalocele associated with microphthalmos. (Ophth. Society of the United Kingdom). Ophth. Review, 1906, p. 156.

[3]Reported to Milwaukee Medical Society, 1896.

[4]Reported to Puget Sound Academy May, 1921.

oculists. He presented a picture of grave granular conjunctivitis, limited to the right eye. There was a thin pannus of the upper part of the cornea. He was admitted to the hospital, and treated with roller forceps, brossage and canthoplasty. Two months later he resumed his occupation, returning from time to time afterwards. The following winter he had an ulceration on the cornea, which was healed, resulting in central leucoma. The trachoma was then apparently cured.

CASE 3.—C. E. Age 20. German descent. Hostler. Consulted me February 12, 1896. He was generally healthy, but presented monocular trachoma of the third stage, with cicatricial contraction. The cornea had a complete pannus. He was admitted to the hospital where expression, brossage and canthoplasty were done. He rapidly recovered and was treated later by massage with yellow oxid ointment and boric acid powder.

The recent cases follow:

CASE 4.—Mrs. T. N. Housewife. Swedish origin. Age 26. Came January 16, 1920, with the history that she had contracted the disease in the right eye six years ago. Her sister had trachoma in only one eye, and had entirely lost her sight, altho she had received much treatment. I did not see the sister to corroborate this. The patient had been under much local treatment with nitrat of silver, blue stone, etc. This is a type of trachoma in the cicatricial stage, with much hard granulation and a moderate degree of pannus. Sent to the Columbus Sanitarium where excision of the tarsus and canthoplasty were done. Subsequent treatment by silver nitrat and copper sulphat. Remained under my personal care for about three weeks and was then treated by Dr. Partlow, of Olympia, with occasional blue stone applications, with cuprol ointment at home. Has been seen several times during the last eighteen months. Returned August 4, 1921, with a hard ridge of granulations on the upper lid. This was excised and on last examination; August, 12, 1921, the eye was quiet. Prescription of cuprol ointment was given for home treatment. The vision of the right or affected eye, with correction of the refraction, is 6/VIII, of the left 6/VI.

CASE 5.—Mrs. F. A. B. American. Age 25. Housewife. Came January 27, 1921, stating that she had infection in the left eye four years ago. She was a farmer's wife and remembered some of the help having sore eyes. The right eye is perfectly normal, vision 6/VII. The left is practically blind owing to very dense pannus, which has existed for a year or more. She has received much treatment, being subjected nine months before I saw her, to an attempted excision of the tarsus, but this was unfortunately followed by a traumatic ptosis. The left eye was the picture of a trachoma in the cicatricial stage with some hard granulations and a pannus crassus, while the right was normal. We had full laboratory examinations in order to exclude syphilis, tuberculosis, tumor formation, and proliferation. These, together with the Wassermann, blood count, urine and tuberculosis tests, as well as the examination of a piece of the granulation tissue, showed characteristic trachomatous formation. Carbon dioxid snow was used, which cleared the roughness of the lid and the pannus was mitigated. March 3, 1921, at the Virginia Mason Hospital, external incision of the lid was made, and the stump of the levator palpebrae muscle was found and advanced-on the lid, producing and over correction which, however, after two months became normal with perfect movement of the lid and perfect closure of the palpebral fissure. Five deep catgut stitches were used. There was some irritation from these resulting in the formation of a lump which, however, gradually passed away, until, at the present writing, the lid is soft and pliable. She has been under constant treatment for six months by carbon dioxid snow, nitrat of silver, blue stone, and on several occasions brossage and excision of any redundant tissue. She bids fair to be under treatment for a long time yet, as the case is by no means cured and granulation tissue persists in forming.

These five cases of special gravity, complicated by pannus and ulceration of the cornea, are somewhat unique. But together with others that I have seen personally, and those that have come under the observation of other ophthalmologists, prove that true trachoma may be acquired and exist in one eye alone without resultant infection in the other.

OPHTHALMIC HERPES ZOSTER.

HAYWARD G. THOMAS, M. D.
OAKLAND CALIFORNIA

M. B. age 55, was sent to the County Infirmary March, 1921 as suffering from erysipelas. He was treated for erysipelas for several days when an interne, Dr. Froelich, asked me to see the man who was in the isolation ward. Dr. Froelich's diagnosis was herpes zoster, in which I could readily concur. I have reported this case as one of the most complete pictures of herpes zoster ophthalmicus I have seen. The only etiologic factor to be found was the wretched condition of the teeth: pyorrhea, old roots, etc., which he obstinately refused to have touched. On general "tonic" treatment the eruption gradually cleared, but neuralgic pains persisted for some time. The right upper lid was left with a large cicatrix, but the cornea was untouched.

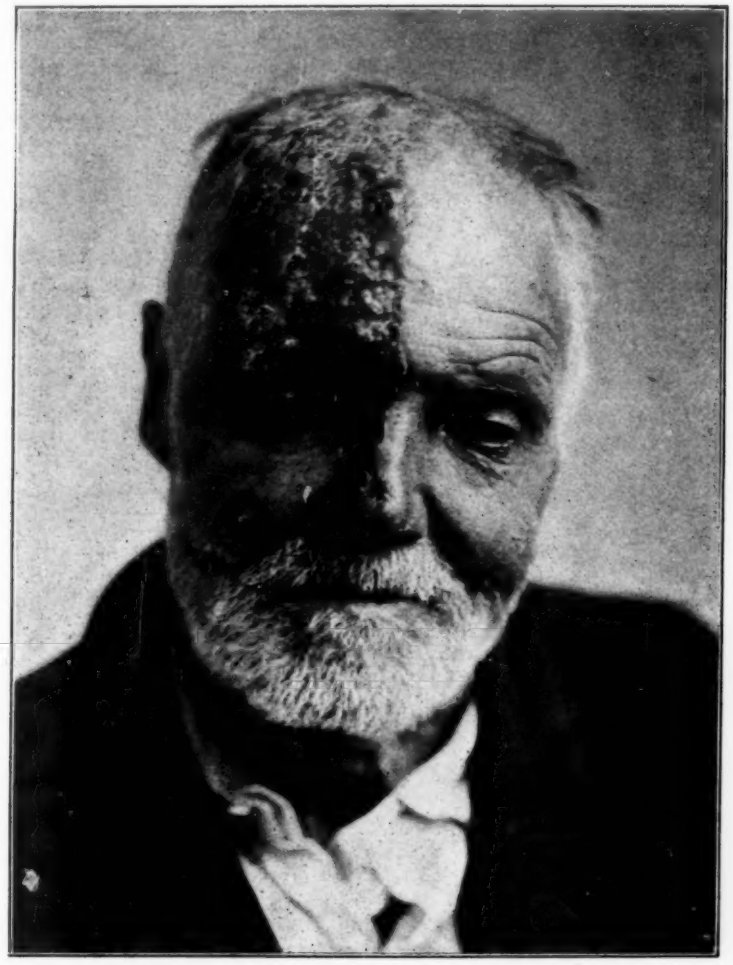

Fig. 1.—Ophthalmic herpes zoster. Thomas' case.

TOXIC AMBLYOPIA FROM ALCOHOL AND COPENHAGEN SNUFF.

EDWARD J. BROWN, M.D.

MINNEAPOLIS, MINN.

The following cases are, perhaps, worth reporting, both for the contrasts they present and for the toleration to alcohol and tobacco, in the second case. Both cases were seen within three days.

CASE 1. Thru the kindness of Dr. C. M. Oberg I was permitted to examine J. P., 45, laborer, who for twenty years has chewed one box (one ounce) of Copenhagen snuff daily and up to four months ago took six ounces of vanilla extract every night. Two years ago he found he could not see well and the opticians he consulted could not greatly improve his vision. Vision is now R. 20/70 and L. fingers at ten feet, not improved by lenses. There is slight atrophic cupping of the optic discs and the retinal vessels are considerably contracted. The form fields are irregularly contracted from twenty to forty degrees. The blue is nearly as large as the white, and red and green abolished. At a late visit I found vision: R. 15/200, L. fingers at 30". The accompanying chart shows the right blind spot taken on my map at two meters with an 18 mm. object, and the left paracentral scotoma taken with a 40 mm. object.

Case 2. A. A. 34, W. U. Telegraph lineman. His Norwegian father had been a hard drinker and the boy began to help himself to his father's bottle and snuff box at the age of seven. Since the age of 18 he has used one box of "Copenhagen" daily and has used alcohol freely. Vision R. 20/40 and L. 20/30, O. U.—20/15 with +0.37 cyl. axis 45. The temporal discs are cupped but otherwise the vascularity is about normal, The form fields are mostly inside thirty degrees, red and green inside fifteen degrees and no central scotoma for colors. The blind spots are large but it was not possible to determine their limits. The corneas are anesthetic and the tension 25 and 26 with the Brown tonometer.

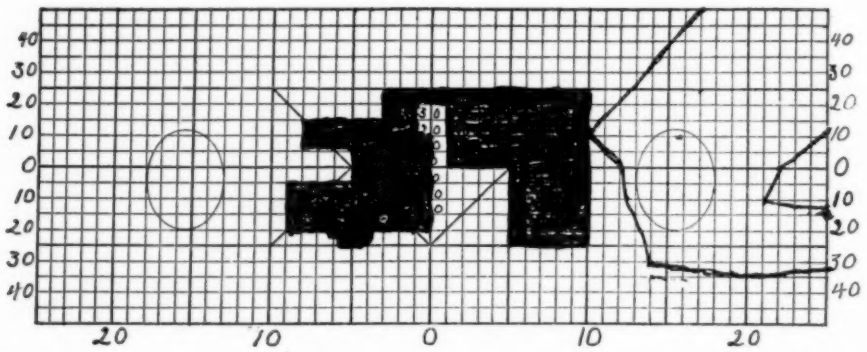

Fig. 1.—Field in toxic amblyopia showing blind spot of right and paracentral scotoma of left eye in Case 1. (Brown's chart.)

EYE COMPLICATIONS OF VARIOLA.

JAY C. DECKER, M.D.

SIOUX CITY, IOWA

Read before the Sioux Valley Eye and Ear Academy, July, 1921.

According to Parsons (Pathology of the Eye, 1324) smallpox or variola was a frequent cause of blindness before the advent of vaccination, having been variously estimated to cause one to eight per cent. From thirty eight to seventy eight per cent of the eye complications in variola involve the cornea, and generally show themselves from the twelfth to the fourteenth day.

CASE 1. Mrs. S. V., aged 24, was examined November, 1920. Five days prior, she had what was termed a mild attack of La Grippe. Two days later the right eye became red and the lids swollen, gradually becoming worse, with a thick yellow seropurulent discharge, marked redness of the conjunctiva, photophobia, and two small white spots of infiltration in the superficial layers of the cornea, which did not stain with fluorescein. A smear made from the discharge showed a very large broad bacillus which was unidentified. No culture was made.

The patient was given a collyrium. She did not return, but three days later she was quarantined for small pox. Subsequent examination showed the conjunctivitis gone, but she still had the two areas of infiltration, which partly disappeared following the use of dionin and yellow oxid of mercury ointment.

The interesting feature of this case is that the eye symptoms began and had reached their climax before the time of the first appearance of the skin eruption.

CASE 2. Mrs. T., age 52. Examined April eighteenth immediately after her release from quarantine on account of variola, stating that at the time of the appearance of the eruption, the right eye became very red and painful, especially complaining of a photophobia and increased lacrimation. Examination showed an iritis in the right eye; and an area of infiltration, in the inner part of the cornea extending from the nasal margin nearly to the center, which did not stain with fluorescein. There were some adhesions of the iris in spite of the fact that the pupil was fairly well dilated with atropin prescribed by the family physician.

After a few days treatment in the hospital, with heat, atropin and salicylates the iritis practically cleared up and the patient was allowed to return home.

On May fourth the eye seemed to be slowly improving. On May twelfth, almost two months after the onset of the variola, the patient returned complaining of increased pain and photophobia and showing a slight abrasion over the area of infiltration. She returned to the hospital, where in spite of all treatment, the ulcer continued to spread and slough for a number of days, until I curretted away all necrotic tissue, when there was a decided improvement within twenty four hours. At the end of two weeks, she was again allowed to go home with the ulcerated area entirely healed over, but still showing slight conjunctival redness.

This case presented a condition which I have not seen before and which I believe is unusual, in that the ulceration of the cornea appeared at least six weeks after the first appearance of the eye symptoms.

In the skin as a result of the hematogenous infection, a coagulation necrosis occurs in the cells of the rete malpighii with a cellular exudation from the vessels of the papillae. By the action of pyococci, the contents of the pock become infected resulting finally in the characteristic pustule. We have all seen, many times, however, smallpox lesions which never progressed beyond the papular stage but which eventually desquamated throwing off a small hard mass of desiccated epithelium which corresponds to the size of the original papule. This I believe explains what happened in this last case. I believe we had here a smallpox lesion which failed to suppurate and yet which later, due to the attempt of nature to throw off the necrotic tissue, brought on the ulceration of the cornea.

According to Del Monte, on the basis of statistics in Italy, corneal lesions of smallpox are frequent in children. In my own limited experience, this has not been the case, as fully seventy-five per cent of the eye complications of variola I have seen were in adults.

The severity of the eye complications is not always proportional to the general disease.

TREATMENT. In the way of prophylaxis, so long as there is only a moderate amount of conjunctivitis which is really a part of the disease, the fre-

quent use of a boric acid collyrium and the applications of a mild antiseptic ointment to the lid margins serves the double purpose of treatment of the conjunctivitis present and the prevention of more serious complications, especially those affecting the cornea.

For the iritis, the usual treatment with atropin, dionin and hot applications generally suffices. For the more severe corneal lesions, as the keratitis and actual ulcers, the same treatment with the additional use of trichloracetic acid to the ulcerated areas. In cases where there is a necrotic slough which does not detach itself readily, it should be removed by gentle currettage. The continued use of dionin and yellow oxid of mercury ointment, over a considerable period of time, does much to aid the absorption of the corneal scars or infiltration.

PARALYSIS OF CONVERGENCE. REPORT OF CASES.

J. P. Israel, M.D., U.S. P.H.S.

NEW YORK CITY

The following cases are reported, not because of the rarity of the condition, but because it is easy to overlook such conditions.

Of the following cases, one of the patients had been treated at several hospitals and states that at one hospital the doctor advised operation on his eye muscles. Any one who is familiar with ocular muscles can readily appreciate how the busy doctor may slip up on his diagnosis. Too much emphasis cannot be laid upon the importance of the Wasserman test as an aid in diagnosing pathologic ocular deviations whether the condition is due to an individual muscle paralysis or not. To me it is equally as important as proper refraction of all muscle cases. The fact, that two of the three cases reported have positive Wassermann reactions, prompt one to ask the questions: 1. Whether or not we are dealing with a lesion of syphilis, the manifest symptoms of which are a paralysis of convergence; 2. If such is a common symptom found in syphilis and is being overlooked; 3. Is it an early or late manifestation of syphilis; 4. Where is the center of convergence?

Several of my colleagues have been consulted and all maintain that the center of convergence is in close proximity to the center of divergence, which is located near Deiter's nucleus in the medulla oblongata. I shall not attempt to go into the differential diagnosis of this condition but will say that before making the diagnosis of paralysis convergence, it is necessary to differentiate between: 1. Convergence insufficiency; 2. Paralysis of the individual muscles (internal recti); and 3. Divergence excess.

Case 1. E. L. H. Age 41. Colored. Male. Admitted to Out-Patient Clinic on March 30, 1921, on complaint of double vision. Past history, rheumatism three years ago. Venereal disease denied. Present trouble started three years ago following an attack of rheumatism. Patient began to see double at that time and this condition has constantly grown worse.

Examination reveals vision R. 20/100; L. 20/70 corrected to R. 20/20 with a plus 50 sphere, plus 75 cylinder axis vertical; L. 20/20 with a plus 70 sphere, plus 50 cylinder axis vertical. Fundus and media clear. Pupils react to light and accommodation. Near point of accommodation 22½ cm. o.u. Examination of extraocular muscles shows associated movements normal in all fields. No individual muscle paralysis. There is exotropia of 14 degrees for near,—1½ degrees of exotropia for distance. Tangent screens shows crossed diplopia in the primary field, not increasing in any other field. Patient unable to converge to the slightest degree. Neurologic examination negative, except some suspicion of inequality of knee jerks. X-ray of skull and paranasal sinuses negative. Blood Wassermann positive. Diagnosis, paralysis of convergence.

Case 2. H. A. J. Age 22. Colored. Male. Admitted to Out-Patient Department on April 8th, 1921. Complaint, patient constantly annoyed with

double vision. Family history negative. Past history negative. Venereal disease denied. Present trouble dates back seven years, when patient suddenly noticed that everything he looked at appeared to be double. Condition has progressed very slowly.

Examination reveals 20/20 o.u. vision. Media and fundi normal and clear. Pupils react to light and accommodation. Near point of accommodation o.u. 12 cm. Near point of convergence 225 cm. Examination of extraocular muscles shows 7½ degrees of exotropia for near; orthophoria for distance. Associated movements in six cardinal positions all normal. No individual muscle paralysis. Tangent screen shows crossed diplopia in the primary field, remaining the same in all other fields. Neurologic examination reports negative except some inequality in knee jerks. X-ray of skull fails to reveal any pathology in paranasal sinuses. Blood Wassermann positive. Diagnosis, paralysis of convergence.

CASE 3. J. E. D. Age 42. White. Male. Admitted to Out-Patient Department for examination on April 7th, 1921. Patient complained of double vision. Family history negative. Past history of no consequence. Venereal disease denied. Present trouble started three months ago when patient suddenly began to see double.

Examination reveals the findings as follows: Vision 20/20 o.u. Fundi and media clear. Pupils react to light and accommodation. Patient accepts a plus 1.25 sphere before each eye for near work. Near point of accommodation 29 cm. Near point of convergence 150 cm. There is an exotropia of 7½ degrees for near; orthophoria for distance. Associated movements in six cardinal positions normal. No individual muscle paralysis. Tangent screen shows crossed diplopia in primary field, remaining the same in all other fields. X-ray of skull and paranasal sinuses negative. Blood Wassermann negative. Diagnosis: Paralysis of convergence.

SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly the important scientific papers and discussions.

NETHERLANDS OPHTHALMOLOGICAL SOCIETY.

June 13, 1920.

PROF. G. F. ROCHAT, PRESIDING.

Translated from the Tidschrift v. Geneeskunde by Dr. E. E. Blaauw.

Tetanus Following Injury.

J. VAN DER HOEVE reported the following cases: 1. A boy was wounded in the left eye while throwing spears; the wound healed. Three nights later, he began to scream, his face was stiff and the mouth could be opened only with difficulty. On the tenth day, he was admitted to the hospital. He had trismus and left facial and abducens paralysis. In the left eyebrow, there was a slight wound, from which pus was pressed and which was connected with a second fistula in the conjunctiva. The vision in the left eye was 2/10. The wound was enlarged; and three days later, there was another about 25 mm. Long wooden splinters were extracted from deep in the orbit, which contained tetanus spores. The patient died sixteen days after the injury in spite of carbol injections after Bacelli. The temperature never rose above 38°.

2. A three and a half year old child came home screaming with a bleeding left eye. The family physician could find nothing; but five days later the child began to groan. On the seventh day, the mother removed a piece of elder wood, 18 by 18 mm. from beneath the upper lid. The complaints ended; but the boy came to the clinic with a mucopurulent discharge, blepharospasm and slight edema of the upper lid with blue discoloration at the temporal side. In the upper fornix was a wound of the conjunctiva. The cornea was slightly opaque, but the pupil and iris were normal. Four days later, the mother mentioned that the boy could not open his mouth easily. He put his tongue out with difficulty, and the masseters were very tense.

The wood contained strong tetanus poison which killed mice in a short time. In the wound exudate of the mice, tetanus bacilli were found. During sleep, the right facial occasionally contracted. There was complete stiffness of the neck; severe facial cramp, especially left; right facial spasm. The abdomen was tense, but the reflexes not too high. The left oculomotor and abducens were paralyzed; the left facial remained stiff with tetanus. Spasmodic attacks were frequent. The temperature was between 37.4° and 39.4°. One month after the injury, the child was cured; only while sneezing, which happened frequently, was his face distorted on the left side.

The presence of wood in the conjunctival sac is very dangerous; Small wounds here may become foci for tetanus infection. These cases also indicate that the family physician should refer all ocular lesions which he cannot examine thoroly to the specialist. After traumatism of the orbit, globe or conjunctiva with wood, a prophylactic injection with antitetanus serum should be given.

DISCUSSION. H. Snellen recently treated a woman, 21 years old, who had received a small wound under the right eye, followed by nose bleed, caused by a spear thrown by a boy. A week later, the wound in the skin was closed and covered with a scab, without inflammatory symptoms. The mobility of the left eye was, however, strongly restricted in different directions, indicative of contusion of the muscles or nerves. This, however, could not explain a coexisting paresis of the facial nerve with lagophthalmus of the same side. The right eye showed oculomotor paralysis with ptosis and divergent strabismus, and an extensive choroiditis. These had long been present.

Two days later there was a slight fever, 37.4°; and trismus developed. Antitetanus serum was injected without result. Four days later the patient succumbed.

Fuchs saw a remarkable case of tetanus ten years ago. While a man was busy slacking lime in a hole in the ground, he had an epileptic convulsion and fell forward, but was immediately pulled out. He had lime in the nose, mouth, throat and eyes. Fuchs removed a quantity from the eyes. He was admitted to the hospital and developed tetanus ten days later, and died on the second day following. The peculiarities were that the exposed wounds were very superficial, and that the tetanus developed in spite of the aseptic effect of the lime.

Mulock Houwer wished to know when injection could still be expected to have therapeutic value.

Van der Hoeve thought this could be answered by the experiences of the war. He was impressed with the prominence of paralyses. The facial paralysis is especially important diagnostically. Publication of further cases is desirable.

A New Principle in Cataract Extraction.

A. VERWEY considers the expression, extraction of cataract, incorrect; as the forceps is not yet made, which can extract the opaque lens. He mentions Barraquer's method, which was shown in a film at the Société Francaise d' Ophtalmologie. He constructed a concave spoon, the hollow handle of which was connected with a bottle with a fixed negative pressure. This was regulated thru a second opening in the front part of the handle, which can easily be closed with the finger. A suction force of 3 m. water height is sufficient for drawing the lens from a pig's eye.

In his experiments, the entire eye hung at the spoon, but the zonule did not give way. He tried suction, but this was less stable. No damage thru escape of the vitreous occurred, but the finer openings in the spoon became obstructed. The capsule ruptured and lens particles were drawn up, lessening the suction power.

DISCUSSION. Van der Hoeve likes Barraquer's operation, because the ideal of removal of the lens in its capsule, without pressure on the vitreous, is obtained. The method was first indicated by Stoewer in 1902, who had a few good results. Like Verwey, Van der Hoeve has experimented according to the indications of Barraquer by connecting his suction apparatus with a water air pump. He succeeded a few times in extracting the lens from pigs' eyes; but he usually failed, or the suction was not strong enough, or the capsule ruptured and lens particles obstructed the tube. He found that in rabbits' eyes, and sometimes in pigs' eyes, the vitreous was so united to the capsule that it appeared a single mass.

Waardenburg asked whether an iridectomy must first be performed, and whether there was danger of hemorrhage with arteriosclerosis.

Rochat feared suction of the iris and difficulty from pupillary narrowing after section.

Verwey did not fear hemorrhage because there is no negative pressure on the deeper parts after suction of the lens.

Van der Hoeve saw the vitreous escape in experiments with pigs' eyes. This danger is less in human eyes but not impossible.

Artificial Immobility for Eye Operations.

G. F. ROCHAT injects one cm. of a 2% novocain solution with adrenalin. The needle is introduced one cm. back from the point, where the vertical tangent at the lateral orbital margin is crossed by the horizontal tangent of the lower orbital margin. The needle, on touching the bone, is directed upward and then along the lateral orbital border; on withdrawal ½ cm. is injected. The same is done below. The injection must take place in the muscle, not subcutaneously. After about fifteen minutes, the orbicularis is entirely paralyzed. The lids are opened slightly; and the patient cannot close them actively. Operation can be performed without any difficulty, and squeezing is avoided. A well applied wet bandage keeps the lids in contact. After an hour, the paralysis has disappeared. There is no disturbance afterwards.

The method has been used in all sorts of operations; extractions of the lens, removal of iron with the giant magnet, iridectomies, trepanation, strabismus, iridectomy in acute glaucoma with much injected bulb, and for optical iridectomy in children, and in deaf people. It has also been used in introducing the hand magnet with presenting vitreous but without loss of it, altho the patient was very restless and squeezed strongly with his sound eye.

The injection is extended by making the superior rectus muscle insensitive. The tendon of this muscle is grasped with the forceps thru the conjunctiva far backward, lifted in a fold, and the needle pushed from below into the belly of the muscle; ½ cm. is sufficient. The fluid must be brought well backward to prevent an undesirable edema of the conjunctiva. After a few minutes, the operation can be performed without the patient being able, voluntarily, to look upward. If he is requested, he can, however, look upward. By this method, the iris was better anesthetized than by simple instillation. The method was also useful in tenotomies and advancements of the interni and externi; but where an over correction is possible, Rochat would not use it.

It seems sufficient to neutralize the reflectoric movements, which is accomplished, as small quantities of novocain paralyze the proprioreceptive fibers of the motor nerves (Magnus and Liljestrand); while the motor fibers still act.

Discussion. From a historic viewpoint, Zeemann mentioned that Straub in 1910 had the same idea and made the injection upon himself. He found that voluntary squeezing increased the intraocular pressure so much that it seemed futile to use these injections regularly. As Rochat often observed a paresis only, Zeemann thinks it probable that the action depends chiefly upon a weakening of the reflectoric tonus of the orbicularis. Altho the method was rejected on theoretic grounds, he has been induced to try it after Van Lint's publication; he was quite satisfied with it, but needs more experience before reaching a conclusion.

Weve confirms from his own experience the favorable results of the temporal paralysis of the orbicularis and the intraorbital muscles. He uses a 3-5% novocain solution with adrenalin and a 0.2% potassium sulph., for difficult cases of extraction. He had good success in a case of hysteric spasm of the orbicularis.

Van der Hoeve uses the injection only for special cases; it is not entirely without danger. He rather opposes its use for strabismus operations.

Rochat thinks that, as one cannot regulate a strabismus operation exactly, it does not matter very much.

Herpes Zoster Ophthalmicus with Complications.

C. Otto Roelfs saw a twelve year old girl on April 8, in whose eye washing soda had fallen. The mother had then washed it out. On the next morning the eye was red, and there were epiphora and headache over it. Two days later, vesicles appeared on the right upper lid and face. On April 14, the skin over the right eye up to the hair was red and full of vesicles. The right pupil was somewhat wider than the left. As the skin eruption had extended, the patient was admitted to the hospital two days later.

An erythema toxicum bullosum was suspected. On the skin, there was an angiokeratoma of Mirelli (Dr. Van der Valk), which had been present for a long time. A few very small inguinal lymph nodes were palpable. There were some painful, submaxillary lymph-nodes and some behind the lower jaw at the right side. Before the left ear was a small painless gland. The condition improved slowly.

Two weeks after admission, the patient complained of poor vision in the right eye and inability to keep it open. With both eyes open she had double vision. She had a right oculomotor paresis with affection of the inner muscles. Lumbar puncture showed only a pleocytosis, 30. This paresis was nearly cured at the end of a week, but pupillary rigidity remained. There was

also a corneal affection like the superficial keratitis punctata of Fuchs. A few months later there was still pupillary rigidity; the cornea exhibited small superficial opacities in the periphery. The iris seemed slightly atrophic at the temporal side; and below two small atrophic gray spots were visible, which he considered scars from a herpes of the iris. Scars of herpes zoster were seen in the skin over the right eye, and there was distinct hypesthesia. After exertion the right forehead became reddened and the right pupil was rigid; but the eye could accommodate 7-8 D. Binocular single vision was present in all directions.

While the patient was in the hospital, varicella appeared in the members of her family. Roelofs thinks that the poison, which in other cases of varioloid, produces herpes zoster, was the cause here. It affected those nerve elements, which on account of the injury and its strong stimuli, were temporarily below par. The first branch of the trigeminus and the Gasserian ganglion were here to be considered. A propagation from the ganglion to the meninges explained the pleocytosis of the spinal fluid.

Roelofs mentioned Verhoeff's findings in a case of superficial keratitis punctata, in which he found necrotic spots directly behind Bowman's membrane, formed by leucocytes.

Roelofs found only a scar condition in the iris, but this may result from the fact that the iris often becomes affected much later.

Roelofs also saw another patient. He treated an electrician for electric ophthalmia of the right eye, following a short circuit. Some months later he returned, complaining of photophobia. He had at that time a typical superficial keratitis punctata, as described by Fuchs; and the iris showed a large atrophic spot at the temporal side. The stroma had entirely disappeared so that the pigment layer was laid bare. Below the pupils were two violet papilla, which with strong magnification showed as vascular conglomerations. The pupils were enlarged and there were some Descemet spots. One of the papilla disappeared leaving an atrophic spot. The patient was then lost sight of.

In 1918, a dispensary patient showed scars in the iris similar to those of the first case. In both patients the pupillary reaction was lost.

The Light Sense in Myopes.

L. Bierens de Haan examined with four different objects, the vision, the perception circle, the perception extent, the optical extension sense and "point vision," with different illumination and different contrasts. He examined normal persons and 60 myopes. He proved that the vision is rather regularly disturbed in myopes; and that with diminishing illumination and contrast, vision diminished to a greater extent than in emmetropes. But for the optical extension sense, the influence of illumination and contrast appeared less distinct. The speaker draws conclusions regarding the position of the cones and the eventual distension of the retina.

Discussion. Waardenburg referred to the investigations of Steiger, whose conclusions have been accepted by the Swiss ophthalmologists, that the so-called school myopia does not exist; but that the different results of the refraction are a necessary consequence of the combination of the optical constants, determined by heredity (chiefly refraction power of the cornea and axis length of the eye). He knows only one criticism, a posthumous one of Straub.

For him, an uncertain point has always been the distension symptoms at the posterior pole of the eye in slight degrees of myopia. It would be important to investigate as to whether two groups exist, those with and those without distension symptoms, and whether school myopes belong to the first. He asked whether de Haan had made this distinction. He was astonished that de Haan's conclusions had been that in general there was a diminution of the light sense in myopia, tho it was not caused by distension and displacement of the nervous elements. The question then was by what, and

did de Haan know anything about the light sense in hypermetropes.

De Haan replied that he examined only eleven persons in each group so that he did not feel able to decide positively between hereditary, acquired or pathologic disturbance. He would not care to give an explanation of the light sense disturbances found.

Judgment of Professional Demands on the Visual Acuity and of the Loss of Labor Value.

A. VERWEY is impressed with the different demands upon vision for different social situations. The term, vision, is often used indefinitely and very arbitrarily.

He thought that a first step to amelioration and order in this chaos would be made by giving an exact and surveyable representation of the existing ideas; and he considers that he has found something practical. Eleven diagrams illustrate his meaning. He also expressed his idea by making a framework, representing part of a cube. From this cube, the construction of which is based upon figures taken from practice and experience, all important values can be read. It gives a clear representation of the loss of vision after an accident resulting in damage; and this loss has to serve as a principle for the rational determination of the annuity due the patient for the decrease in his labor value. Besides the actual loss of vision, the degree of vision necessary to function in each trade should be considered.

DISCUSSION. According to Schoute, the value of a table was that it comprised in a narrow space a great number of facts, already known. Heretofore, in the determination of the labor capacity there has been a lack of facts. There has been an effort to clear up the subject by creating tables and formulas. The tables are in advance of known facts. Schoute thought it necessary to warn against an impression of certainty, which is involuntarily received from Verwey's table and graphical representation. Schoute does not feel that all Verwey's computations rest on facts. They rest on judgments of the Hyksverzekeringsbank (the official institution for determining the annuity), and these are nearly always conjectures. Consider the difference of opinion which exists regarding the simplest case, namely loss of one eye.

Verwey declared that he limited himself to vision because one can arrive at a clear representation of this factor. By mutual deliberation, series of numbers can be given and an eventual disturbance quantitatively determined, at least of this one factor. It is true that one does not know the actual diminution in the labor value in different trades; but the first step has been made, which will lead to a generally accepted scale to estimate the loss of labor capacity.

Ocular Affections in Tuberose Brain Sclerosis.

J. VAN DER HOEVE stated that Bourneville first described this condition as tuberose or hypertrophic sclerosis of the cerebral circumvolutions.

Affection of One Half of the Optic Chiasm.

S. P. BAKKER's patient had a carbuncle of the neck in the latter part of August, 1919, which healed in about ten days. At the beginning of September, he complained of poor vision in the right eye. He had photophobia and headache, localized over the eyes. The ophthalmologist found beginning hemorrhagic retinitis. Within two weeks the eye was blind. The rhinologist found the nose negative.

On October 7, a protrusion of the globe of 1.5–1 mm. appeared with slight restriction of all movements, with the exception of those of the superior oblique. The fundus showed papillitis with slight swelling and very tortuous vessels. Vision O. S. was 1., emmetropic; tension —1. Antiluetic treatment, not for specific reasons, was continued, followed by slight improvement and excellent general condition. On October 29, the patient felt suddenly ill, with severe headache, vomiting and fever. Vision O. S. had diminished. On November 3, he was admitted to a hospital. The condition of

O. D. was unchanged. The vision O. S. was much reduced with a temporal hemianopsia bordering over the fixation point. The nasal visual field showed only a slight peripheric constriction. The pupillary reaction was typically hemianopic; O. D. did not react to light but did react consensually with illumination of the nasal field of O. S. The diagnosis was an affection of the chiasm, and the patient was transferred to the neurologic clinic.

Temperature was 39.2°, and there was a trace of albumin. Babinski in left. The sella turcica was not enlarged. The patient succumbed suddenly five days later from respiratory paralysis.

Section of the brain alone was permitted. An extensive basilar meningitis was present, localized chiefly around the chiasm and medulla oblongata. The chiasm was swollen and contained a small opening, from which purulent fluid escaped on pressure. Microscopically, the right optic nerve was thinner than the left; its fibers had nearly all disappeared, their place being occupied by cells. The peripheral part only of the left optic nerve was slightly infiltrated. Near the chiasm, there was a cavity in the right optic nerve, communicating with that which replaced half the chiasm. The left direct bundle remained intact.

The patient was therefore suffering from cerebral abscess, localized in the right half of the chiasm, which perforated and produced fatal meningitis. The wall of the abscess was distinctly visible at the posterior part of the purulent focus in connection with the right tract. A slight leptomeningitis was found at the convex part. Especially at the base, many cells were seen in the pia; while in the medulla oblongata, also, cells were found along the vessels. The cells were chiefly polymorpholeucocytes; here and there foci of staphylococci were present.

The course of the disease may be explained if staphylococci from the carbuncle reached the major circulation, thus coming into that branch of the ophthalmic artery which nourishes the right optic nerve. Here they caused inflammation, which progressed along the lymph sheaths and provoked a cerebral abscess, extending over the right half of the chiasm. Judging a posteriori, the entire process might probably have been prevented by timely enucleation of the globe. There would have been a possibility that the process would not have progressed into the skull.

The right eye had become blind six weeks before death. The left tract was examined according to Marchi. Even then a pathologic granulation behind the chiasm was present, which could be traced thru the entire tract. At the medial side, more granules were found than at the lateral side and center. A heavy granulation was seen at the n edio-ventral and medio-dorsal margin especially, the periphery of the lateral field remaining free. As the influence of the inflammation is not known, no conclusion can be drawn as regards the position of the crossed bundle, and also as regards the lateral corpus geniculatum, which showed more pronounced granulation in the medial region, the location of the fibrilization of the corpus quadrigeminus.

Discussion. Zeemann stated that the blood was not examined completely; a hyperleucocytosis would perhaps have given a hint of connection with the furuncle.

The Shape of the Skull and the Orbit.

E. Marx has for years been interested in the influence, which the shape of the head exercises on the orbit and the position of the eyes, and also the influence of the growing eye, if any, upon the orbit. He refers to the opinion of Virchow and Bolk, regarding the growth of the skull bones. If the coronal suture closes prematurely, a compensatory enlargement must take place toward the sides and upward, producing oxycephaly. If the sagittal suture closes too early, the scaphocephalic skull develops with a strong increase in length and height. Besides the scaphocephalus virus and scaphobilobatus (Topinard), a third form seems to exist, which can be considered as a transition toward the oxycephalic form.

The only case report is by Redslob (1909).

Marx's case is that of a somewhat backward and timorous child, especially afraid when someone attempts to touch his bulging eyes. The vision is about 5/10, 1 D. hyperopic. The discs are somewhat indistinctly limited and grayish. The forehead rises steeply and is asymmetric; the right side is flattened, the left somewhat bulging. Over the glabella, a crest begins to rise, extending over the frontal suture, slightly convex to the right. The crest continues over the sagittal suture in a frontal depression, which is nearly parallel behind the coronal suture. The curved nose is convex to the right; the lips are thick; the eyes very prominent; the lids close well. The marked protrusion is contrary to what is usually found with scaphocephaly. The cephalic index is 83.3, strongly brachycephalic, which is a quality of oxycephaly. The exophthalmus must be explained by the orbits being too short. This is an intrauterine development because the general relations of the face and skull were present at birth.

Marx examined 45 normal skulls, 8 scaphocephalic and 6 oxycephalic. The index, which gives the relation of the orbital depth to the greatest length of the skull, is .1 of the medial orbital wall times a hundred giving an average for normal left orbits, 414; for right ones, 411. In oxycephalic skulls, this index is left 453 and right 450; and in scaphocephaly, 423 and 418 respectively. These indices in scaphocephaly, being somewhat larger than in normal skulls, demonstrate that the orbit did not take so great a part in the increased growth in length of the skull, as did other parts.

The deviating skull forms have as symmetric orbits as the normal ones; which confirms the hypothesis that the sutures can dispose bone not only in one direction, but also vicariously in others. The medial wall of the orbit in normal skulls is as an average 2.5 mm. shorter than the lateral; in oxycephaly, this difference is 4 mm.; while in scaphocephaly, the medial wall is 1 mm. longer than the temporal. These relations must be explained by the general disturbances in growth. The chief cause lies in the skull base.

The orbits in scaphocephaly are somewhat extended in breadth in comparison with the normal, while the orbit in oxycephalic skulls is about normal. But the entrance of the orbit in oxycephaly is smaller in its entirety; its height is reduced, left 1 mm., right 1.5 mm.; but its breadth has lost more, left 6.5 mm., ler. 5. mm. One must consider that the orbit is shorter than normal because of the backward development of the frontal bone, which explains the general smallness of the orbital opening.

COLLEGE OF PHYSICIANS OF PHILADELPHIA, SECTION ON OPHTHALMOLOGY.

April 21, 1921.

Dr. G. Oram Ring, Chairman.

Retinal Detachment.

Dr. Robert Scott Lamb, of Washington, D. C., read a paper, by invitation, which is published in full in this Journal, p. 668.

Discussion. Dr. H. F. Hansell said that successful treatment of retinal detachment, like that of other diseases, is dependent upon accurate knowledge of etiology and of the morbid process underlying the disease. We must decide in any given case, insofar as we are able, the following: Is the cause essential shrinking of, or the formation of a band in, the vitreous; is it degeneration of the retina itself following inflammation of the ocular tissues; is it exudation, fluid or solid, between the choroid or retina; is it a choroidal tumor; or finally, is it stretching of the sclera as in myopia. It is manifestly wrong to attempt therapeusis, either operative or medicinal, on all or even the majority of cases according to one principle. Indeed, detachment of the retina should be considered rather as a symptom than as a disease. The so-called spontaneous cases are also symptomatic of a causative affection. Failure of treatment may therefore be ascribed to one or two causes, namely, ignorance of the etiology, and the im-

practicability of any line of treatment directed toward the symptom and not the disease.

Dr. Burton Chance stated that the history of the treatment of detachment of the retina is at once the opprobrium of and a challenge to Ophthalmology. It is a reproach, insofar as so few cases have shown reattachment and even partial restoration of function. In the course of the year one meets with many varieties of cases, not all of which can be diagnosed and treated so promptly with such brilliant results as in Dr. Heed's startling case of a few months back. It is not simply the separation of the retinal sheet from its apposition to the choroid with which we have to deal, else we should constantly find immediate, progressive, and permanent widening of the space in every case of perforation of the tunics of the bulb. Indeed one is likely to be astonished to find surgical and other traumatism unaccompanied by detachment.

While our failures are a reproach, there is an increasing understanding of the metabolic processes which affect nutrition and the purposes of the endocrine system in maintaining the functions of the organism; this understanding of the vital processes, Chance holds to be an answer to the challenge by which our past lack of success defies us. Therefore, Dr. Lamb's suggestive contention is most welcome. For us to rely upon the puncturing of the bulbar tunics, by one method or another; or the injection of fluids into a globe which for months had been occupied by fluids retained thru disordered physiologic osmosis, would be, indeed, a reproach. He would urge therefore that such a course of nonsurgical procedures as Dr. Lamb has here outlined ought never to be neglected even after operations. He was greatly interested in the history of a case of wide detachment and disability, as told to him by Dr. Lamb, while in Washington early in February. When later he was given an opportunity to examine the patient the gentleman was able to read a magazine; and the fundi showed concavities free from distinctly raised retinae.

Dr. Peter said: During the past few months I have had under my care a young woman, aged twenty-eight years, who developed, in the fifth month of pregnancy, rapid loss of vision, and was admitted to the Samaritan Hospital for observation. Induction of labor was decided upon and instituted. The patient's vision, however, became worse in both eyes, and was reduced to simple hand movements at two feet. Examination revealed complete detachment of both inferior halves, with considerable elevation of the detached retina extending well up to the disc. In the upper halves there were numerous areas of beginning detachment. Systolic blood pressure was 240 mm. As the "accoucheur" did not favor the use of hot packs, the patient was transferred from the obstetric to the ophthalmologic department for treatment. This consisted of six weeks of absolute rest in bed, especially on her back. Bicarbonat of soda was administered by mouth daily. The patient received a hot pack daily and free saline cartharsis was employed. At the end of six weeks the patient returned home with complete reattachment of both retinae, and the fundus at this time showed only minute atrophic spots here and there in the attached areas and in the upper parts of the retinae.

Dr. C. R. Heed stated that the case history presented by Dr. Lamb was not a selective one for the Mueller operation. He felt that the present status of a patient presented before the Section at the December meeting substantiates the merits claimed for the scleral resection operation in proper cases. The patient's vision previous to operation was 6/LX, eccentric; one month after operation, 6/XXI; five months later, 6/XXI+, with full visual fields.

Dr. S. Lewis Ziegler was glad to know that Dr. Lamb had found thyroid extract of service in cases of retinal detachment. He first began its use in these cases many years ago, after it proved useful in absorbing subretinal hemorrhages. He now has several cases under observation where the results have been most encouraging. He thinks, however, that cases of traumatic detachment, e.g., following a blow to the head, are the most responsive to this therapy.

He has had a few most excellent results

from posterior sclerotomy in cases that were seen early, but it is difficult to formulate exact rules of procedure since cases that look least favorable recover, while hopeful ones often result in failure.

Choroidal Exudate Simulating a Foreign Body.

Dr. Harold G. Goldberg again exhibited his case of choroidal exudate simulating a foreign body which had been presented at a recent meeting. There was very little change in the appearance of the eyeground at this time, the pigmented area was more sharply defined, and the exudate more completely absorbed, so that it really had more the appearance of a foreign body than when first seen. The eye, at this time, showed no signs of inflammation, and the vision had improved to within one line of normal.

Tendon Transplantation in Paralysis of the External Rectus.

Dr. William M. Sweet presented a girl, aged seventeen years, upon whom a portion of the superior and inferior recti muscles had been transplanted for the relief of a complete palsy of the external rectus muscle which had existed from childhood, probably congenital. The technic of the operation was somewhat similar to that described by O'Connor. After the tendons of the three muscles had been exposed by a circular incision around the outer half of the cornea, the external halves of both the superior rectus and the inferior rectus muscles, with the overlying Tenon's capsule, were cut off close to the sclera, and firmly secured by separate sutures. Instead of joining the tendons of the vertical recti to separated strands of the externus, as suggested by O'Connor, the externus was completely severed from the globe, after the usual threads for advancement had been inserted. The severed tendon of the superior rectus was then sutured to the upper portion of the stump of the externus remaining on the eyeball, and the inferior to the lower portion, and the externus was then advanced in the usual way, somewhat covering the new points of attachment of the transplanted vertical recti. The cut edges of the conjunctiva were then sutured. The internus was not cut, as it was desired to note the effect of the transplantation with advancement of the externus. Prior to operation the convergence of the left eye was about 30°, with no power of outward rotation. At the end of ten days the patient was able to turn the eye outward 20°. A tenotomy of the internus was then performed. At the end of six weeks the effect of the several operations was a power of outward rotation as measured on the perimeter of 35°.

Discussion. Dr. L. C. Peter said the technic employed by Dr. Sweet in this operation simplifies the procedure which Dr. O'Connor adopted in his cases, and which he also used in his own case reported in this Section several months ago. Dr. Clarence Harris and others have used this same technic with good results. He believes it is essential that a tenotomy of the internus be performed at the time of the operation in order to remove the strain upon the stitches. Advancement of the external rectus is equally important even tho there probably will be no innervation of the external rectus because of paralysis of the nerve supplying it. There is considerable elasticity of the muscle which in itself will tend to hold the eye in primary position.

Dr. Wm. Campbell Posey said that at the March meeting of the Wills Hospital Society he had exhibited a case of pronounced upward squint in the right eye, in a young man, which had dated from birth. All downward motion in the right eye was lost, except down and in, in which position the eye could be slightly depressed by the action of the superior oblique. Actuated by the success of Dr. Peter's reported case and with Dr. Peter's aid and counsel, Dr. Posey proceeded to transplant the inferior portion of the right external and internal rectus muscles upon the inferior rectus. Examination showed, however, that the inferior rectus muscle was absent, a few strands of muscle fibres at the point of normal insertion of the muscle into the globe being alone present. Hoping, however, that some action might be gained by the transplantation of a portion of the ten-

dons above referred to, this was done, the end of the tendons being sutured to the muscle stump. Free tenotomy of the superior rectus muscle was made at the same time. The results were gratifying, the squint being entirely corrected, the eyes being on the same horizontal plane. Downward rotation for the right eye was also somewhat better. There was but slight reaction.

Traumatic Tenotomy of Inferior Rectus.

Dr. P. N. K. Schwenk showed a patient, aged twenty-eight years, a carpenter's helper, who while at work, March 11, 1921, was hit in the right eye with the end of a board, severing the attachment of the inferior rectus from the globe. He was treated at the Chester Hospital, but the muscle failed to become united to the globe and slid backward into the lower cul-de-sac. When first seen at the Wills Hospital the eye could not rotate below the horizontal plane and the patient was annoyed by the diplopia. On April 14, under general anesthesia, Dr. Schwenk made a horizontal incision across the globe, dissecting well the conjunctiva below the attachments of the cicatrix and at the inner side of the globe. The cicatrix was then loosened from the eyeball, the dense cicatricial mass excised, and the muscle with Tenon's capsule brought up and held in place by two hair pin sutures. One end of the inner thread was passed under the tendon of the internal rectus and the other into the sclera back of the horizontal plane, and the thread tied. One end of the outer thread was passed under the tendon of the external rectus muscle, and the other end into the sclera and conjunctiva, and tied. In order to do this a small slit was made into the end of the muscle and tissues so as to come up under the loosened conjunctiva. The patient has fairly good downward rotation, and at this time is free from diplopia. The stitches will not be removed until assured of muscle attachment.

Discussion. Dr. Geo. H. Cross stated that the case exhibited had originally come under his care and when first seen the torn and bruised end of the muscle remaining attached to the eyeball was protruding between the eyelids. There was intense chemosis and after the use of cold compresses, a mattress suture was passed thru this part of the muscle, and an attempt made to find the inner fragment of the muscle. Being unable to do so the muscle was fastened well back in Tenon's capsule with the hope that we would be able to correct part of the hypertropia. Without his knowledge he was admitted to the Wills Hospital and fortunately for him came under the care of Dr. Schwenk, who has obtained a perfect result by the unique method he has described.

Ptosis Operation.

Dr. Charles R. Heed reported the case of a boy, aged three years, affected with congenital ptosis of the left eye. He performed a Motais operation February 8, 1921. Three days after the boy's discharge from the hospital the suture supporting the lid cut thru and the tongue of the superior rectus slipped back away from the lid. He performed a Hess operation upon the same lid March 24, 1921. The three suspensory sutures were removed twenty-three days after the operation, the lid presenting a natural appearance and free from irritation. Two days after their removal an abscess developed along the course of the external suture, the swelling from which obliterated the crease at the outer half of the lid. The abscess was evacuated and prompt subsidence of the reaction was followed by perfect movement of the lid and a natural crease. Dr. Heed felt that sterilization of the sutures by painting with iodin before their removal might prevent such infections.

Discussion. Dr. Wm. Campbell Posey said he thought the Hess operation a procedure of great value and called attention to the fact that the sutures should remain at least three weeks in situ, to gain the maximum effect from cicatricial contraction. He also, in several of the cases he had operated on, excised a small elliptical segment of skin from the upper wound margin. This augmented the effect of the lid raising and also was often of value

from a cosmetic standpoint, enabling one to make the folds of skin in both upper lids symmetric.

Cavernous Sinus Thrombosis.

Dr. Warren S. Reese reported (by invitation) two cases of cavernous sinus thrombosis, the first unilateral and secondary to an otitis media. Autopsy showed that the cavernous sinus had become involved by extension thru the bone along the course of the carotid canal. The causative organism was the streptococcus hemolyticus. The second case was bilateral, and resulted from a nasal furuncle. Autopsy was not obtained.

The author reviewed the anatomy, and the literature pertaining to thrombosis of the cavernous sinus, and expressed the hope that more attention may be given to early diagnosis and the development of operative measures, which heretofore have not been very successful, necessary to combat this otherwise usually fatal affection.

Discussion. Dr. Hunter Scarlett referred to a recent article in the Archives of Surgery by Chisholm and Watkins, who collected 12 cases of cavernous sinus thrombosis, while reviewing 50,000 histories of the Johns Hopkins Hospital. The three most common causes were found to be (1) marasmus, (2) trauma, and (3) infection, the last named the most frequent. The symptoms resulted from (1) venous obstruction, (2) involvement of the neighboring nerves, and (3) general sepsis. They found that only 7% recovered without operation, and 7% with operation.

Snowball Vitreous Opacities.

Dr. T. B. Holloway exhibited two cases of socalled snowball opacities of the vitreous, and stated that the thought at least two types of vitreous capacity should be differentiated, namely, the snowball opacities and the true cases of synchysis scintillans where we have a deposition of cholesterin crystals in the vitreous. During the past twelve years he had seen more of the former type than of the latter. He referred to six cases of snowball opacities that had come under his observation since his last report on this subject in 1917. He called attention to the recent microchemical investigations of Verhoeff, and, while he agreed with this investigator's belief that it was a degenerative process, he questioned whether intraocular angiosclerosis was the most important factor in its production. He felt that more stress should be put on the altered state of the blood and the conditions, whatever these may be, that are responsible for it.

Discussion. Dr. Wm. Zentmayer said that one of the patients exhibited by Dr. Holloway was seen by him at Wills Hospital about one month ago. The vitreous condition was then diagnosed as "synchysis scintillans." From a further study of the case he saw no reason to change the diagnosis. The opacities are of varying shape, apparently flat and surely scintillate. The retinal condition is one of albuminuric retinitis of the arteriosclerotic type with hemorrhages. In the case recently published by Dr. Verhoeff, Dr. Zentmayer had had the good fortune to examine the vitreous as prepared by Dr. Verhoeff for demonstration, and certainly the opacities were of such an appearance as to merit the term "snowball."

Dr. Burton Chance said that he had seen the classically described cholesterin crystal cases more frequently than such as were characterized by Dr. Holloway as snowball opacities. The case of synchysis which he exhibited is in his judgment nearer to the type of the snowball or asteroid hyalitis than is the case of Dr. Holloway. Of this type he recalls six or seven cases he had seen; two of which were negroes. In all there have been more or less remote changes in the tunics; in none, however, were the changes so extensive as are to be seen in Dr. Holloway's present case.

Dr. Holloway stated that he had already pointed out that the local conditions attending these two types of opacity were the same. He desired to call attention to the fact that these opacities did not have the metallic sheen or glitter shown by cholesterin, but that they appeared almost a dead white or possibly cream colored, and then

only when in focus; that the character of the movement of the two types of opacity in the vitreous was different; that the snowball opacity behaves much as a buoy and remained white just as long as it was in focus, and this stood out in contrast to the less regular fall of the cholesterin crystal with its varying scintillation.

DR. CHARLES R. HEED,
Clerk.

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

Meeting of August 9th, 1921

Injury to Cornea and Iris.

DR. E. C. ELLETT reported the case of F. H., referred by Dr. Shea July 15. He was hit that afternoon in the right eye by a chip from a hammer, and showed a wound in the cornea and iris to the nasal side, and traumatic cataract. X-ray showed a large foreign body, which was drawn into the anterior chamber by the large magnet. A keratome incision was then made down and out, opposite the location of the body, an iridectomy made and the particle removed with the tip of the small magnet. An attempt to remove the body without making the iridectomy, caused it to catch in the iris and he was afraid to proceed. There has been violent reaction, but no infection, and the eye looks as if it would be lost. The f. b. is 5x2x8/2 mm.

DISCUSSION. Dr. Lewis Levy had a very similar case of foreign body in which a panopthalmitis developed and he had to enucleate.

Dr. Ellett also showed sections from the main portion of the melanotic sarcoma of the choroid, reported by him at the last meeting.

Hemorrhagic Glaucoma.

DR. ELLETT reported the case of Miss P., aged 67, seen in March, 1921. The right eye had begun to fail three or four years before, at which time it was treated. The left eye has always been poor since sore eyes at six. R. vision, moving objects. The details were dim, but the disc seemed to be cupped to the outer side, and some dark splotches were seen which appeared to be retinal hemorrhages of various ages. Tension 52 Schiötz. L. thin corneal scar. Vision 20/50 with glasses. Urine showed a trace of albumin, Blood pressure 165. A month later the eye became painful and tension rose to 57. The whole cornea was steamy and stained over the lower half. Tension L. 17. The right eye was removed May 26. On section the retina showed extensive hemorrhages, but the gross specimen was not preserved. Sections were shown as follows. (aX) The anterior segment. The angle of the anterior chamber is free, but the cornea shows irregular thickening and superficial degeneration.

(b) The nerve entrance showing marked cupping.

(c) A section of the whole eye. which shows the above features and also extensive retinal hemorrhages in all the layers of the retina.

Metallic Foreign Body Removed From the Eye.

DR. E. C. ELLETT also reported on H. J., referred by Dr. Stevens of Greenville. May 25th was hit in L. by a chip of metal from a hammer. An effort was made to remove the body before Dr. Ellett saw him, May 29. There was a corneal wound to the nasal side, and a dark particle that might be a foreign body on the iris to the outer side. Large and small magnets had no effect. The X-ray was then taken and the foreign body localized in the lens. The small magnet then drew the particle up. The lens was already opaque, and a regular cataract extraction was done. The foreign body did not come away with the lens but was removed with the magnet. 7/22 vision; 20/30 with glasses.

DISCUSSION. Drs. Shea and Simpson thought that the vision would not improve.

Homonymous Hemiopia.

DR. ELLETT reported a case of homonymous hemiopia. Mrs. L. aged 64, experienced a sudden difficulty in sight, speech and memory in Oct., 1920. Central vision was perfect. The fields showed a typical right homonymous hemiopia and the nasal edges of the

discs were a little veiled. The condition has remained the same with no other symptoms, and suggests a left optic tract lesion with involvement of the speech center.

Strabismus.

Dr. Ellett showed two cases.

Case 1. J. E., aged 21. Convergent squint since typhoid at 11. Left eye turned in 35° as measured by the Priestley Smith tape. Vision R. 20/20, L. 6/200. No binocular vision. Hyperopia about 5 D. Squint not improved by glasses but vision of R. was brought to 20/40.

July 9. Resection of the left externus and complete tenotomy of the L. internus was done. (Reese technic.) There was a good deal of swelling at the site of the resection. Sutures removed on the 9th day, when a small yellow slough was noted at the site of the tendon insertion, or just behind it. A ring of granulation tissue sprang up around this and this persisted till it was cut away on Aug. 3rd, exposing a circular slough about 3 mm. in diameter. It did not involve the whole thickness of the sclera. The slough came away Aug. 5th, and healing has progressed rapidly. The cause of the slough is uncertain as the scleral anchorage is not used in this operation. Perfect cosmetic result.

Case 2. J. C., aged 23. Says the left eye has always turned. Squint 15°, vision R. 20/40, L. 2/200 with glasses, R. 20/25+. Has no binocular vision. July 18. Resection L. externus and tenotomy L. Internus (Reese technic.) Sutures removed on the 8th day. Six degrees of convergence remained. August 1st, R. Externus tucked and complete tenotomy of R. internus. Slight over correction but the eyes are parallel.

Discussion. Dr. Savage thinks the best results are from complete tenotomy. He has gotten good results from partial, but has never seen a bad result from complete tenotomies.

Internal Squint of 45 Degrees—Immediate Effects.

Dr. A. C. Lewis reported the case of C. G. a girl of 15 years. V-R. 20/20; L. 20/200 refracted 3 days ago. R+3.00+50×90=20/20: L.+4.00 sph.=20/100.

Had between 45 and 50 degrees of internal rotation of left eye. Duration 10 or 12 years—never wore glasses.

Under local anesthesia a Reese resection of left external rectus was done and a guarded tenotomy of both internal recti.

The result is very promising and probably will not necessitate further operative interference.

Discussion. Dr. Ellett has never been afraid of getting over correction in squint operations. He has recently had a 25° over correction in a case of squint done under ether, but hopes to bring the correction down to normal. He has never seen a good result from a partial tenotomy. He operates for cosmetic results only.

Sclerosing Keratitis.

This case was reported by Dr. A. C. Lewis. Mrs. A. L. W., age 53, was first examined on Sept. 18/20. She had a dense white corneal infiltration 2×4 mm. in size in the outer lower quadrant of the right eye. The sclera and conjunctiva adjoining was congested and thickened. V. R.=20/50—L.=20/20. Media clear in both eyes. Duration 2 months.

1% atropin; 5% dionin and 2% yellow oxid ointment prescribed. Oct. 4. All inflammatory symptoms gone.

July 20/21. Patient returned with similar trouble in left eye. Says it has been sore for a month with dimness of vision. Upper fourth of cornea has a white, milky deposit in the deep corneal tissues. Numerous small peripheral spots at other points. Surface epithelium smooth and unbroken. Circumcorneal injection present as before. Same treatment given for eye plus K.I. gr. XX t. i. d. internally. The opacities are again clearing up rapidly and the eyes are perfectly comfortable again.

Discussion. Dr. Ellett asks if the case was investigated for focal infection.

Dr. Lewis said that the tonsils, teeth, sinuses, and urine had been gone over carefully and that the patient had negative Wassermann.

Dr. Simpson said that great emphasis had been placed on T. B. as a cause, and believes that it is a frequent cause. He suggests a T. B. test.

Alternating Internal Squint with Chronic Trachoma.

Dr. A. C. Lewis reported this case. Mr. C. H., age 40, has been treated for granulated lids for 3 years with only temporary relief. Has never been able to use his eyes together and sees double most of the time. Wears glasses prescribed by him June 5/21. O. U. plus 1.25 sphr. plus 1/2 × plus 1 diopter of astigmatism in R. and L. respectively, oblique axes=20/20 V. in each eye.

3 days ago (Aug. 6) under local anesthesia Dr. Lewis did a guarded tenotomy of the left internal rectus and a thoro expression of all trachomatous granulations from his eyelids. His eyes measured 20 degrees of internal strabismus 3 days ago and today appear straight, but measure 10 degrees of esophoria. He is not troubled with diplopia today. The eyelids are looking comparatively smooth.

S. S. Evans, Secretary.

ABSTRACTS

Komoto, J. Luxation of the Eyeball in a New Born. Nippon Gank. Zasshi, March, 1920.

The child came on the second day after birth to the writer with a luxated right eyeball. The cause was probably due to a birth impediment, as the child had on the same side at the hip a large swelling, which on incision proved to be a large lymphangioma, altho it was alleged at birth no forceps were used. The luxation is likely due to an intraorbital hemorrhage, as an incision with a knife showed a large collection of blood.

The author relates his old observation on the luxation of the right eye of a man, who while intoxicated was injured thru a violent contact with a tree stump. He also reports a spontaneous luxation which was astonishingly well described in an old Japanese book, and the cause was given as an inborn relaxation of the muscles, as it is also described in the newest books.

H. A.

Colin, A. Preparation of Eye and Patient for Cataract Operation. Ann. d'Ocul., 1920. v. 157, p. 765.

This consists of two steps; 1. preliminary, 2. preoperative.

Preliminary: a. Asepsis of the conjunctival sac. This consists of the use of 4 to 5 drops of collyrium each morning for eight days before the operation. The collyrium consists of zinc sulph. 2.0, ammonium chlor. 0.75, camphor 0.45, safron 0.10, aqua 150.0; allow to stand fifteen days before using. b. Asepsis of the lid margins. On the fourth and eighth days before the operation, the margins are vigorously rubbed with a cotton tampon, slightly moist, which has been dipped in a solution tinctur of iodin. No iodin should touch the cornea or conjunctiva. c. Asepsis of the lacrimal passages. On the same days the passages are syringed with yellow astringent lotion, 2 cc. are injected. The permeability of the passages is tested at the same time. d. Education of the patient in opening and closing lids and moving eyes. e. Purging with 25.0 sodium sulphat the night before the operation. f. Bath the night before operation. g. Night and morning of the two days before the operation, the patient is given bromides.

Preoperative: a. Disinfection of the skin of the vicinity with tinctur of iodin, followed by injection of allocain to paralyze the lids temporarily. When the latter is accomplished, vigorous rubbing of the lid margins with tampons of tinctur of iodin. b. Toilet of the lacrimal passages. Several cubic cc. of sterilized water, or in case of doubt of yellow astringent collyrium, is injected. In the latter case, the patient is warned to let it run out of the nose. c. Toilet of the fornices. Lavage with half a liter of sterilized lukewarm water from a special flask.

The author has had more than 200 operations since 1919 without a panophthalmitis.

C. L.

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JEAN MATTESON, Room 1209, 7 West Madison Street, Chicago, Ill.

LETTERS FOR SUBJECTIVE TESTING OF REFRACTION.

Our charts of test letters are used for two entirely different purposes; one to test the acuteness of vision at the point of fixation, the other to test the effect of lenses on the clearness of perception of such letters. For the first purpose the variations in the visibility of the different letters is a defect, but for the subjective testing of refraction these differences of visibility add greatly to the usefulness of the test letters. This is true to a greater or less degree of all alphabets, Roman, Greek, Hebrew or Slavic, or the written or printed characters of any race.

Since charts of test letters have been proposed there has been a general effort to choose letters of visibility as nearly equal as possible. To use letters as a standard of visual acuity this was desirable; and because we cannot get letters of exactly the same visibility, they are inferior to a constant figure, like the broken ring, as a visual acuity test. But their differences of visibility especially fit them for use in the subjective testing of errors of refraction, and this advantage has not been sufficiently appreciated.

To improve his chart as an instrument for measuring visual acuity, Snellen excluded many block letters, the form he had chosen as best fitted for the purpose. But the fact remains that when constructed on the basis of the five minute angle only two block letters, B and S, come near to testing standard visual acuity. Some have still further restricted the number of letters used on their charts, as Oliver to only seven; and, without getting near the ideal for a visual acuity test, they have to that extent impaired the value of their test cards for the subjective measurement of errors of refraction.

For this latter purpose it is desirable that as many letters as possible should be employed, provided they can be distinctly formed within the same extent of space. A few letters like M, W, I, and J vary so much in the area they occupy that they are not well adapted to the purpose. But within this limitation of equal area, the more different let-

ters we can use for testing refraction the better. It is a great advantage to have on one line of letters those that will require several different degrees of visual acuity to make them out. Thus between L, most easily seen, and B that needs to be nearly twice as large to be recognized, we may introduce several letters of intermediate visibility and thus test four or six improvements of distinctness of perception, on a single line of as many letters.

The fine gradations of accuracy in the correction of an astigmatism or myopia, which a single line of letters can thus afford, is what makes the subjective test the final arbiter of refractive errors, and renders it possible to correct them with minute accuracy. The letters for each line of a test chart should be selected with this in mind. Each line should contain some of the easy letters and some of those it is most difficult to see.

To use test letters to the best advantage in measuring ametropia, two distinct methods should be employed. One is to ask the patient whether a certain change in the glass makes the sight better or worse. This is truly a subjective test dependent on the patient's accuracy of judgment. It requires that the change in the lens should be great enough to make a distinctly noticeable change in the clearness of the letters. It can be tried with the least loss of time, and can be repeated the largest number of times in a given period. But it is liable to lead us into serious errors thru failure of judgment on the part of the patient, unless it is frequently checked up by the other method.

The second method is to require the patient to prove that he sees better by recognizing letters that he has not previously recognized. This adds certainty to the result of changes of glasses made to improve vision, and gives the testing with letters the value of an objective test. To carry this out it is necessary to have test cards with which the patient has not become familiar. For this reason it is worth while to have samples of all the good test cards that can be secured, and to take a fresh one every time one needs to test with a line of letters that the patient has already learned on the card in use. This need to change the card occurs chiefly when using the lines of smaller letters such as indicate standard or nearly standard vision. To meet the need quite a small card is all that is necessary, and a series of such supplementary cards has been found very convenient.

Finally, no set of test letters is complete unless it includes one or more lines that require better than standard vision, to recognize them at the distance at which they are used. It is not enough to have the patient show standard vision, the subjective measurement of refraction is not complete until the eye has shown the best possible vision of which it is capable; and this is sometimes double standard vision. The better the vision of which the eye is capable the more likely it is to be annoyed or strained by an inaccurate correction.

E. J.

A GREAT MEETING.

The gathering of five hundred Fellows of the American Academy of Ophthalmology and Oto-Laryngology at Philadelphia, altho some staid away because they could not attend both this and an International Congress six months later was in itself a notable achievement. But this record-breaking attendance was overshadowed by other features that made the Academy's celebration of twenty-five years of growth and progress of unique significance.

The three days graduate course helped to swell the attendance. It was known in June that the 350 seats that would be provided for those who wished to see and hear the demonstrations had all been taken. But with provision for those who were to give the demonstrations, a few guests and a number who came long distances hoping for a chance to get the opportunity, the lecture room of the Academy of Natural Science was packed with almost 500 at each of the joint

sessions. The number present at the opening of the course, Wednesday evening in the ball room of the Bellevue Stratford hotel was much larger.

This opening meeting was addressed by the eminent foreign guest of the Academy, Prof. J. Van der Hoeve of Leiden, and Prof. Ernest Sachs of St. Louis. Another foreign guest was Prof. Fuchs of Vienna. Both he and Prof. Van der Hoeve while speaking with a noticeable foreign accent were able to choose their English words with such excellent judgment as to make themselves clearly and easily understood. The next evening they addressed in similar fashion a meeting of the Section on Ophthalmology of the Philadelphia College of Physicians that packed the Wm. Thomson lecture room of the college, while those who came late were unable to get in.

Both in the graduate course and in the regular scientific meeting, in which the foreign guests repeatedly took part, the use of the projection lantern added greatly to the interest and value of every session. Many of those who opened the discussions on the papers presented had carefully prepared and written out their remarks.

There was very little of the unprepared desultory discussion that too often protracts the sittings of scientific meetings.

The special exhibit of pathologic histology at the laboratories of the University of Pennsylvania was too far from the place of meeting to draw any large number at 5 o'clock on the third day. But those who attended it found a larger and better arranged collection of slides under the microscopes than even those shown last year.

But the event which promises most for the Academy and for the profession was the adoption of the working agreement with the office of the Surgeon General of the Army for the establishment of a Museum of ophthalmic and oto-laryngologic pathology. Fellows of the Academy are to preserve their specimens and send them to the Surgeon General's Office. There they will be prepared, cut, stained and mounted for microscopic study. Specimen slides will be sent to the donor of the specimen. Others will be studied by specialists in ophthalmic or oto-laryngologic pathology who will report on them. Slides, photographs, and diagrams of important conditions will be prepared, which will be loaned to those Fellows who desire to use them for illustration or teaching.

There were other notable features of the meeting, as the holding of examinations both in ophthalmology and in oto-laryngology, for candidates who desired admission to the Academy, of whom a large number were passed. But enough has been told to demonstrate the great importance of this particular meeting, and the probable value of the meeting to be held next September in Minneapolis.

E. J.

CORRECTIONS.

In the paper by Dr. John M. Banister on the Surgical Treatment of Concomitant and Paralytic Strabismus in the September number of the JOURNAL, on page 660, column one, line 18 "about 40 mm. linear measure" should read, "about 4 mm. linear measure."

In the discussion of Dr. Satterlee's paper on "Problems in Prescribing Prisms" by Dr. E. E. Blaauw, in the August JOURNAL, page 628 column one, line 27, "chorioretinal changes" should read "lenticular changes."

In the paper by Dr. P. J. Waardenburg on "Encephalitis Lethargica" August JOURNAL, p. 584 column two, line 31 "Liegebeek van Henkelom" should read "Siegenbeek van Henkelom"; and in the Bibliography of this paper, p. 591, line 15, the name should appear "Van Henkelom, Siegenbeek."

BOOK NOTICES

Wilbrand, H. and **Saenger, A. Die Neurologie des Auges, VIII Band.** Bewegungsstoerungen der Augenmuskeln. Large 8 vo, 496 pages, 6 plates and 40 illustrations in the text. Munich and Wiesbaden. J. F. Bergmann. 1921.

It is a little over a year since the seventh volume of this great work was

reviewed in this JOURNAL (v. 3, 1920, p. 630), and in that time we have noted the death of Prof. Saenger. Such a treatise was only made possible by the closest collaboration of an ophthalmologist and a neurologist; and it is fortunate for our profession that they both lived to complete so much of it. Of the general character and value of the work we have already expressed the highest opinion. There has been no falling off of thoroness or narrowing of scope in this volume.

The pathology of the centers and tracts directly controlling the eye muscles is here most fully set forth. The anatomy of these nerve tracts is first considered under the headings, cortical centers, association centers, the nuclear region, the nerve roots and the nerve trunks. Then the eye movements are considered. The typical include fusion, voluntary, reflex and associated movements; the atypical include the disassociated movements of the new born, those occurring during sleep and those related to pathologic conditions. Retraction movements and the field of fixation are then considered.

The greater part of the book deals with the paralyses of the eye muscles. These are considered under the headings, cortical and supranuclear, nuclear, nerve root palsies, basal, those arising from disease of the cavernous sinus or within the orbital fissure, orbital causes, those arising in the muscle, and the purely functional paralyses, as those of hysteria.

Then the spasms of the eye muscles are taken up, about 90 pages being given to nystagmus. Under nystagmus of toxic origin, some 25 different substances are mentioned as liable to cause it. But it is notable that carbon monoxid is not one of these, and under the heading of miners' nystagmus, the views of Butler with regard to the share of chronic coal gas poisoning in causing the condition receive mere mention. The whole subject of miners' nystagmus is discussed in less than six pages; but the more than thirty references here given to the literature open up the subject most effectively to the student who desires to pursue it.

Nystagmus arising in disease of the brain is given 25 pages and is considered under the headings of 19 different conditions. Its connection with 5 different diseases of the spinal cord is accorded 4 pages; and as accompanying 20 varied conditions of the general nervous system 20 pages are devoted to it. It also receives some attention in other sections of the work, particularly that dealing with reflex movements. Striking evidence of the rapid development of our knowledge of lethargic or epidemic encephalitis is found in the fact that in this work just published it is only briefly mentioned. (Page 100 and foot note to p. 178.)

One might expect in this or the next volume some account of comitant strabismus. But it is not taken up in this or any of the preceding volumes; and it is announced here that the ninth and concluding volume, to appear soon, will deal with accommodation and the pupil, which were to be considered in volume eight. The view that strabismus is essentially an abnormality of the ocular muscles rather than of the nervous system has been a great obstacle to a good general understanding and rational treatment of it. Apparently this view has excluded its consideration from this generally complete and valuable work, an omission all the more to be regretted because outside of the French literature the neurologic aspect of comitant strabismus has been neglected.

E. J.

Festschrift zur des Siebzigsten Geburtstages Herrn Hofrat Prof. Dr. Ernest Fuchs. Octavo, 1232 pages, 6 plates and 326 figures in the text. Berlin, Julius Springer.

This volume, prepared by the friends and grateful pupils of Prof. Fuchs, is a noble and well deserved commemoration of his seventieth birthday and his long and fruitful career as a teacher and investigator of ocular pathology. The exceptionally good photographic portrait which serves as a frontispiece will add to the value of the volume for many who know him only thru his published work. The work is printed as

Volume 105 of Albrect von Graefe's Archiv für Ophthalmologie. This is particularly appropriate, for no one has done more than Fuchs to keep alive and to advance this JOURNAL which serves as the most conspicuous monument of its founder.

The papers contributed to this volume will be found noticed in Ophthalmic Literature under their appropriate heads; and some of them will appear in abstract in this JOURNAL. They number 73, contributed by 75 authors. Of these contributors, 1 lives in Finland, 2 each in Holland, Sweden and Norway, and 3 each in Switzerland and Denmark, while 62 live in what were Austria and Germany, before the World War. This distribution does not reflect the world wide dissemination of pupils and friends of Prof. Fuchs, but rather the disturbance of the relations of scientific men by the great conflict, and the selection of those who arranged this tribute.

The typography and press work of the book are of the excellent quality of the journal of which it forms a volume. Altho there are no color plates, several illustrations in color have been printed with the text. It is a volume that may be viewed with pride and satisfaction by the eminent ophthalmologist to whom it is a tribute, and by those who have contributed to its pages; and it contains much that will be of value to all students of ophthalmology. E. J.

Thomas G. Atkinson, M.D., B. Sc., Oculo-Refractive Cyclopedia and Dictionary. 432 pages. Chicago. The Professional Press, Inc.

This book of 432 pages purports to be a complete unabridged encyclopedia, and dictionary of words and terms dealing with the refraction of the eye and associated subjects assembled in a coordinated form. It has been written and arranged to be of maximum usefulness to the practicing "refractionist," this title being defined on page 372 as "one who is skilled in measuring and correcting errors of refraction of the eye." This is a title that has been usurped by opticians, and is ignorantly used by some physicians. The word is etymologically incorrect, and not good English as applied to the science of optics, for it means one who rebends or rebreaks, and not what it is sometimes held to mean.

For a student of optics, the work has some immediate value, for he may turn to its pages for the definition of a technical word and for its relations to optics. In so far as this goes, it is a book for him, and for the optician. It is well printed and bound and sparsely illustrated with diagrams and cuts of instruments. H. V. W.

A Treatise on Cataract. Donald T. Atkinson, M.D., San Antonio, Texas. Octavo, 150 pages, 29 plates. New York City. The Vail-Ballou Company.

This book, which contains about half as much letter press as one number of this journal, is well written, printed in large type and illustrated with good plates. Of the plates all but three refer to cataract operations, showing particularly the manner of using the operator's hands and holding the instruments. The scale of the reproduced photographs is not large enough to bring out the finer details of puncture incision, etc. But a half dozen diagrammatic drawings show these details better.

The book adds nothing new to our knowledge of cataract or its removal. But it brings together and states clearly and briefly some of the best methods of procedure that have been worked out by the combined experience of our profession. It passes judgment on some of the more recent innovations, rejecting extraction in the capsule, but approving Col. Smith's reasons for disapproving of the conjunctival flap.

The author, by study, observation and experience, has come to definite views with regard to the different points of cataract operations, and sets them forth briefly and clearly with the aid of illustrations, all of which are original and carefully planned. E. J.

Die Diathermie und Lichtbehandlung des Auges. Dr. Med. Leonhard Koeppe, Privatdozent fur Augenheilkunde an der Universitäts-Augenklinik zu Halle a. S. Octavo, 218 pages, 63 figures in the text. Leipsic, F. C. W. Vogel.

This work is a description of methods rather than a statement of results obtained, altho the results are often given incidentally. The figures consist of diagrams illustrating theoretic explanations and halftones showing the apparatus employed and how to use it.

The first part of the book, on diathermia, begins with an introductory and historic review of the subject. Then it takes up the physics, physiology, apparatus and technic of its employment; and after that the special action of diathermia currents on healthy and diseased human eyes. The latter is arranged by anatomic parts, as the lids, conjunctiva, cornea, iris, lens, etc., with special chapters on its influence on intraocular tension and the orbit. There are also bibliographies appended to the different chapters, and one on high frequency and diathermia currents.

The second part of the book, 35 pages, is devoted to the phototherapy of the eyes. After a brief introduction it takes up the treatment of tuberculosis of the eyes with light rays. The theoretic basis and the nature of the light used are first discussed, and then the special apparatus employed and the details of the method. A third chapter briefly goes into some clinical aspects of the subject.

The third part of the book, 28 pages, deals with the treatment of eye diseases by ultraviolet radiations. This, after some general introductory consideration, also gives a chapter on special apparatus and details of its use; and then devotes a chapter to the ultraviolet treatment of trachoma. One chapter is given to this treatment for tuberculosis of the conjunctiva and cornea, and one to corneal ulcer and scrofulous affections with notes on indications and contraindications for this kind of therapy. This part ends with a list of references to its literature.

There is no index, but the table of contents is fairly full, and the book is intended as a guide to the beginner in the special methods here set forth. It gives very little that would help the reader to an estimate of the relative importance of these kinds of treatment.

E. J.

CORRESPONDENCE.

RELATIONS OF OPHTHALMOLOGIST TO OPTICIAN.

To the Editor: Returning from an extended Eastern trip, in the search of light and truth, shocking almost beyond expression were the writer's impressions of the general unethical relations between the oculist and optician in America. He was well aware of the conditions West of the Mississippi, but expected to find them better in the sites of learning and teaching. But close inquiry in the larger teaching places of the East and the middle States, leads to the conclusion that many of the rank and file of the "eye doctors" are accepting rebates or commissions from opticians, and even some real ophthalmologists are not exempt from this imputation.

The general profession is "getting on to" these conditions and that it is adverse to commercialism in ophthalmic practice is shown by resolutions against it passed by local and county societies as noted in the action of the King County Medical Society of the State of Washington, an excerpt therefrom being printed in this issue under News Items.

Are we going to keep this up, to prostitute the Hippocratic oath and sell ourselves for a few pieces of silver? It is true that it is hard to pin down the conspirators. It is not well to mention names or even localities, but I will risk the general assertion that the largest city in our country and also the next largest are notorious in this regard. In striking contrast are the Cities of "Brotherly love," the "Hub" as well as the professional men who practice under the dome of the Capitol and its nearest large city, where oculists who take rebates soon become known and are ostracised.

The fact is that the professional income of the rank and file of the Eastern ophthalmic men, is nowhere near that of those in the West. They do much more eleemosynary work than they do of private practice. The well-paying patients, and especially those who come with the larger operative fees, go to but a few men in each locality; and the temptation to a young man or one who is just managing to get along, to get a few easy dollars, *sub rosa*, as a rebate or commission from the optician for the sale of glasses to his patients, is indeed great.

Where the standard of ethics is especially high, as in Philadelphia, Washington and Baltimore, even the sale of glasses, direct by the doctor to his customer, is not considered as being *haute monde*, altho it is really ethical if the patient knows for what he is paying, and is essential in some localities where good optical service is not available. But when the surgeon sells only his brains, it has been found that the morâle of the optical trade has been uplifted, and that the ophthalmologist who does not dispense glasses, really profits in a general way more by referred cases from the optician than he would if he, too, would be a tradesman and a trafficker in picayune profit taking.

HARRY VANDERBILT WÜRDEMANN.
Seattle, Wash.

DR. WEEK'S VISIT TO PEKING.

To the Editor: Dr. John E. Weeks of New York City, President this year of the American Ophthalmological Society, together with Mrs. Weeks spent three weeks in Peking, China, on their recent tour of the orient. It was a great pleasure for me, Dr. Li and our assistants, members of the Department of Ophthalmology of the Peking Union Medical College, to have Dr. and Mrs. Weeks with us.

This institution, as is probably known, has been taken over and is being maintained by the China Medical Board of the Rockefeller Foundation. Unfortunately we were at that time still working in the old hospital, the new plant not being ready for occupancy until July 1st, so we did not have the pleasure of showing Dr. Weeks our new quarters in operation. Dr. Weeks made several visits to our clinic and was shown a number of our most interesting cases.

The faculty and the ladies of the Peking Union Medical College tendered a tea and reception to Dr. and Mrs. Weeks, after which Dr. Weeks delighted us with an account of some of his professional experiences.

HARVEY J. HOWARD.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply the news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. H. Alexander Brown, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orelans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, LaFayette, Indiana; Dr. Geo. H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. John E. Virden, New York City; Dr. John O. McReynolds, Dallas, Texas; Dr. Edward F. Parker, Charleston, S. C.; Dr. Joseph C. McCool, Portland, Oregon; Dr. Richard C. Smith, Superior, Wis.; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. G. McD. Van Poole, Honolulu. Volunteers are needed in other localities.

DEATHS.

Dr. Stephen C. Ayres, Cincinnati, Ohio, died September 1st, 1921, aged 79.

Dr. James A. Black of San Francisco, California, died September 17th, aged 52.

Dr. Walter L. Chase, Bedford, Mass., died August 8th, aged 52.

Dr. Edgar J. Howland, Goldfield, Nevada, died in August, aged 61.

Dr. Justin L. Jackson, Savannah, Ga., aged 46, died August 11th from typhoid fever.

Dr. William F. Julien, Gary, Ind., aged 46, died June 11th from pneumonia.

Dr. Walter W. Parmalee, Auburn, Me., aged 47, died September 3, following an operation.

Dr. Rohmer, of the University of Nancy, died recently.

PERSONALS

Dr. C. Duane Cobb, formerly of New York, has moved to Oakland, California, with offices at 1225 Washington street.

Dr. Conrad Berens, Jr., announces that Dr. Ray R. Losey is now associated with him at 9 East 46th street, New York City.

Dr. J. N. Roy has been made Prof. of Ophthalmology in the University of Montreal.

Dr. Mary K. Heard formerly of Iowa City, Iowa, has moved to Des Moines, Iowa, with offices 317-318 Kraft building, Seventh and Walnut streets.

Drs. Gifford, Patton, Calfas and Potts announce the removal of their offices to the Brandeis Theatre building, Omaha, Nebraska.

Dr. John O. McReynolds of Dallas, Texas, writes from Barcelona that he has had a wonderful visit with Barraquer, and promises to write all about it on his way home, while on the boat.

In the August number we referred to Dr. M. Uribe-Troncoso, of Mexico, as if he were still living there. This was an error. He has been a resident of New York for five years.

Dr. Harris H. Vail announces that he has established his offices and private hospital in association with Dr. Derrick T. Vail, at 24 East Eighth street, Cincinnati, Ohio. Practice limited to diseases of the ear, nose and throat.

Dr. L. Webster Fox, of Philadelphia spent his summer vacation in Honolulu and was more than pleased with everything the Islands had to offer. The oculists entertained him in royal style. On his return to the mainland he was entertained at luncheon by the local men of San Francisco.

SOCIETIES.

The Buenos Aires Ophthalmological Society has designated Drs. de la Vega, Gil and Soriano, official representatives to attend the International Congress of Ophthalmology and present papers.

The American Academy of Ophthalmology and Oto-Laryngology has just held its twenty-sixth annual meeting in Philadelphia, October 17-22, with the largest attendance in its history. It will meet next year in Minneapolis. Dr. Walter R. Parker, of Detroit, was elected president.

At the September meeting of the Indiana State Medical Association, Indianapolis, Dr. J. A. Stuckey of Lexington, Kentucky, was the guest of honor of the Section of Ophthalmology and Oto-Laryngology. The subject of his paper was "Some Phases of the Trachoma Situation." Others on the program of the section were Drs. W. A. Hollis, Hartford City; C. N. Howard, Warsaw; D. O. Kearby, Indianapolis; Harry Boyd-Snee, South Bend; W. F. Molt, Indianapolis; George F. Keiper, La Fayette; George W. Spohn, Elkhart; M. H. Krebs, Peru.

Thru the efforts of the Louisville Eye and Ear Society and Dr. J. A. Stuckey of Lexington, who is now President of the Kentucky State Medical Association, a section on Ophthalmology and Otology was organized at the recent meeting of the Society at Louisville, September 19th, 1921.

The initial meeting of the Society was held in connection with the annual meeting of the Kentucky State Society. Forty-one registered as charter members. A part of the day was spent in case reports and scientific discussions and a banquet closed the successful session.

The following officers were elected: President, Dr. S. G. Dabney; Vice-President, Dr. Adolph O. Pfingst; Secretary, Dr. G. C. Hall; Treasurer, Dr. D. A. Lederman, all of Louisville. Drs. Dan. M. Griffith, Owensboro; A. B. Carson, Henderson and J. A. Stuckey, Lexington, were named members of the council.

It is the intention of the Society to meet each year on the day previous to the Kentucky State Society.

The Ophthalmologische Gesellschaft in Wien met August 4th to 6th, 1921, and was a great success. In all, sixty-one papers were read before the society, and the discussions were entered into by many besides the Viennese. Abstracts of the papers will appear later in the JOURNAL.

MISCELLANEOUS.

Charlotte, N. C., is to have an Eye, Ear, Nose and Throat Hospital. The building to cost $125,000, one floor for private offices.

The Society for Cinematographic Instruction in Medicine and Surgery has been organized with address at 105 West 73rd street, New York City, to develop and assist in the educational use of motion pictures in medicine, surgery and dentistry.

A new motion picture film in one reel has been produced by the National Committee for the Prevention of Blindness. The film tells of the experience of a mother and her child with blindness, and shows how preventive measures may be applied in order to save the eyes of many of those who thru negligence later lose their sight.

At the meeting of the Council of the American Academy of Ophthalmology and Oto-Laryngology, held in June, it was decided to establish a museum, the collection to be located in the Army Medical Museum at Washington, D. C., and conducted by the curator, the expenses to be borne by the American Academy of Ophthalmology and Oto-Laryngology. Under the regulations of the Army Medical Museum, the pathologic material is open for study to any qualified person; and laboratory and microscopes are available.

September 25 was the date appointed for the unveiling of the memorial to Brisseau of Tournai, Belgium, who published in 1705 the first account of the nature of cataract. The committee in charge of the memorial has republished his account in a pamphlet as a souvenir and bibliophile curiosity. For information address Dr. A. de Mets, 29 avenue Van Eyke, Antwerp. The ancients explained cataract as the pouring out of some substance on the lens from above, and hence the name "cataract."

The American College of Surgeons, with offices at 40 East Erie street, Chicago, Illinois, announces for its Department of Literary Research that it is ready to assist Fellows of the College and members of the surgical profession in their medical literary work thru the preparation of bibliographies, abstracts and translations, the compilation of such material or other editorial work. For such assistance a minimum charge will be made to cover the actual expense of the work.

At the May meeting of the King County Medical Society, Seattle, Washington, the following by-law was adopted:

"Any physician who shall procure for profit a patent for a remedy or for an instrument of surgery, or who sells or is interested in the sale of patented remedies or nostrums, or shall give a certificate in favor of a patented or proprietary remedy or patented instrument, or who shall enter into agreement to receive pecuniary compensation or patronage for sending prescriptions to any apothecary or for sending orders to an instrument manufacturer or retailer or optical company shall be liable to censure, suspension or expulsion in accordance with Article III, Section 8; (it being the intent of this clause to prohibit the acceptance of rebates or commissions, but not to prevent a physician from selling to patients drugs, appliances or spectacles and eye glasses when in his opinion the patients' interests may be protected by so doing.)"

This procedure has effectively settled the question of rebates from opticians to oculists in Seattle, and it has removed the stigma of commercialism from the ophthalmologists of this locality, as those who previously conducted business in this manner have accepted the decision of the governing body with good grace.

This movement will no doubt proceed thruout America, especially as the opticians themselves have the matter under discussion, with prospect of radical action.